

greatly exerted anthers.

In reviewing the species of Prestonia, a problem developed regarding Echites leptoloba Stadelm. The species is incorrectly placed in the synonymy of P. agglutinata (Jacq.) Woods. by Woodson (Ann. Mo. Bot. Gard. 23: 279. 1936; N. Am. Fl. 29: 180. 1938), who probably was misled by the treatment in Martius' Flora Brasiliensis. In the latter work E. leptoloba is synonymized with E. circinalis Sw., now recognized as conspecific with P. agglutinata. However, while both P. circinalis and P. agglutinata are Haitien, E. leptoloba was described from Brazil, "Japurá, Prov. Rio Negro". Is E. leptoloba actually the same as Prestonia acutifolia (Benth. ex Muell. Arg.) K. Sch.? The epistaminal appendages of the latter are sometimes reduced and might have been missed by Stadelmeyer and Mueller Argoviensis. It is significant that Manso 37, cited as E. circinalis by Mueller Argoviensis in Flora Brasiliensis, is identified as P. acutifolia by Woodson.

If the prior E. leptoloba (1841) indeed proves identical with the well-known P. acutifolia (Haemadictyon acutifolium Benth. ex Muell. Arg., 1860), there might result a re-shuffling in names. To preclude this or some other possible disturbance in nomenclature, on this score at least, I have preoccupied the specific name "leptoloba" in Prestonia, thus eliminating Stadelmeyer's species from further involvement in the genus. Such an appropriation is especially desirable as the epithet aptly describes the scale-like calyx-lobes of the new species described above.

With this nomenclatural safeguard from E. leptoloba that is here provided, it does not mean that P. acutifolia surely will remain unchallenged. Unfortunately the contrary is true; there is a likelihood that the species will eventually be submerged in Prestonia quinquangularis (Jacq.) Spreng., for the characters invoked to separate the two are hardly convincing.

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#### MATERIALS TOWARD A MONOGRAPH OF THE GENUS VITEX. VIII

Harold N. Moldenke

##### VITEX ALTISSIMA L. f.

Additional citations: INDIA: Andhra: Santapau 20799 (Xa); Santapau & Wagh 20697 [Wagh 2743] (Xa); Wagh 1306 (Xa), 2359 (Xa). Bombay: J. Fernandez 1380 (Xa, Xa).

The specimens from Andhra, cited above, all consist only of leaves from sterile shoots of young trees. The petiole is broadly alate and the leaflets are distinctly serrate.

##### VITEX COFASSUS Reinw.

Additional literature: Kanehira, Fl. Micrones. 343. 1933; St.

John, Pacific Sci. 10: 101. 1956.

VITEX GARDNERIANA Schau.

Additional literature: N. I. Klein, Anais V Reun. Anual Soc. Bot. Bras. 223. 1956.

Klein, in the reference cited above, records the common name "jaramateia" for the species.

VITEX GLABRATA R. Br.

Additional literature: Kanehira, Fl. Micrones. 343. 1933; St. John, Pacific Sci. 10: 101. 1956.

VITEX MEGAPOTAMICA (Spreng.) Moldenke

Additional citations: BRAZIL: Paraná: Stellfeld 2326 (S). Santa Catharina: Reitz & Klein 131 [Herb. Reitz 4699] (S).

VITEX NEGUNDO L.

Additional citations: INDIA: Andhra: Santapau 20732 (Xa). Bombay: Bai 399 (Xa), 406 (Xa).

VITEX NEGUNDO var. CANNABIFOLIA (Sieb. & Zucc.) Hand.-Mazz.

Additional citations: INDIA: Bombay: Blatter s.n. [22-1-1925] (Xa).

VITEX NEGUNDO var. HETEROPHYLLA (Franch.) Rehd.

Additional citations: CULTIVATED: Germany: Herb. Hort. Berol. s.n. (Us); Herb. Link s.n. (B); Herb. Schreber s.n. [H. Alto. 1780] (Mu--641); Herb. Zuccarini s.n. [Hort. Bot. Monac.] (Mu--644); Langguth s.n. [Hort. Lipz. 10.3.46] (B); Otto s.n. (B, V); Willdenow s.n. [Berol. VI.37] (Cp). Illinois: Schantz s.n. [Chicago, 10/2/1917] (Ar--1797). Italy: Herb. Harvey s.n. [Hort. Bot. Neapol. 1812] (Du--166530), s.n. [H. P. 1820] (Du--166532); Herb. Hort. Neapol. s.n. (Cb); Paperini s.n. (S); Tenore s.n. (Mu--645). Kansas: F. C. Gates 15025 (Ka--71412). Martinique: Duss 422 [94] (N), 2396 (B, B, N), s.n. (B). Massachusetts: L. H. Bailey s.n. [Cambridge, June 21-23, 1919] (Ba), s.n. [Cambridge, Aug. 31, 1921] (Ba), s.n. [Arnold Arb., Oct. 1922] (Ba); Blazic s.n. [Aug. 14, 1922] (Gg--31489); Cornman 3515 (Ba); Herb. Arnold Arb. 3515 (A, Mi--photo, N--photo, Z--photo), s.n. [Bur. Pl. Ind. 17941] (A, K), s.n. [Bot. Gard. Cambridge, July 31, 1889] (A), s.n. [Bot. Gard. Cambridge, Sept. 12, 1890] (A); Kidder s.n. [21 July 1921] (Oa--10748); Loveland s.n. [7-24-1877] (Vt); G. M. Merrill s.n. [July 26, 1921] (Ba), s.n. [Sept. 20, 1921] (Ba); Mohr s.n. [Arnold Arb., 9/20/1895] (W--771903); Rehder s.n. [Arnold Arb., Aug. 5, 1898], in part (E--116130), s.n. [Arnold Arb., 1915] (Ur); Teuscher s.n. [Herb. Arnold Arb. 6953] (B); R. E. Torrey s.n. [Aug. 2, 1843] (Ms); A. P. Wyman 3515 (Io--104299). Missouri: H. C. Jensen 259/06.8 (E--116129). Mongolia: Treviranus s.n. (Le). New Jersey: H. L. Fisher s.n.

[Wm. Savin's farm, Annandale, 9-1-1914] (E--890714), New York: Hartling s.n. [N. Y. Bot. Gard. Cult. Pl. 29997; Bur. Pl. Ind. 21976] (N, N); H. N. Moldenke 4870 (N); R. Pinkus 15700 (Kr); Rising s.n. [July 23, 1923] (Al); R. C. Schneider s.n. [N. Y. Bot. Gard. Cult. Pl. 25862; Bur. Pl. Ind. 17941] (N). Oklahoma: O. H. Calvert 150 (St--24298). Pennsylvania: Mrs. J. M. Phillips s.n. [July 10, 1934] (Cm). Russia: Herb. Hort. Bot. Petropol. s.n. [1835] (K), s.n. (K, K); Herb. Hort. Pawl. s.n. (Us). Scotland: Herb. Univ. Edinb. s.n. (Ed). Spain: Collector undesignated 12 (Q), 35 (Q). Sweden: Agardh s.n. [Hort. Lund] (S). Switzerland: Berger s.n. [La Morbola] (X); Breiber s.n. [15 Aug. 1826] (M); Reuter s.n. [Hort. Genev. 1886] (X). Trinidad: W. E. Broadway s.n. [Trin. Bot. Gard. Herb. 3515] (B, R, W--940081), s.n. [Trin. Bot. Gard. Herb. 4344] (Mi, Mi, R). Virginia: D. A. Bisset s.n. [S. P. I. 17941] (Ar--19758), s.n. [S. P. I. 21976] (Ar--19761). LOCALITY OF COLLECTION UNDETERMINED: Herb. Harvey s.n. [Hort. Burd. 1811] (Du--166531); Herb. Hort. Mens. s.n. (Cb); Herb. Linnaeus G.811, S.9 (Ls, N--photo, Z--photo); Herb. Mus. Nac. Hist. Nat. Chile 16029 (Sg); Herb. Mus. Stockholm s.n. (S); Herb. Prager 18676 (Gg--31487); Herb. Richard s.n. (S); Moll s.n. (Br). MOUNTED ILLUSTRATIONS: Curtis, Bot. Mag. 11: pl. 364. 1797 (N); Fig. 1314 (N).

*VITEX NEGUNDO* var. *HETEROPHYLLA* f. *MULTIFIDA* (Carr.) Rehd., Journ. Arnold Arb. 48: 258. 1947.

Synonymy: *Agnus castus incisa multifida* Carr., Rev. Hort. 1870: 416. 1871. *Vitex incisa var. multifida* C. K. Schneid., Illustr. Handb. Laubholz. 2: 594, fig. 384 m-n. 1911. *Vitex negundo var. incisa f. multifida* (Carr.) Rehd. in L. H. Bailey, Stand. Cycl. Hort. 6: 3481 & 3574. 1917. *Vitex negundo var. multifida* (Carr.) Rehd., Man. Cult. Trees, ed. 1, 777. 1927. *Agnus-castus incisa var. multifida* Carr. ex Moldenke, Prelim. Alph. List Invalid Names 4, in syn. 1940.

Literature: Carr., Rev. Hort. 42: 416. 1871; C. K. Schneid., Illustr. Handb. Laubholz. 2: 594, fig. 384 m-n. 1911; Rehd. in Sarg., Pl. Wils. 3: 33. 1916; L. H. Bailey, Stand. Cycl. Hort. 6: 3481 & 3574. 1917; Rehd., Man. Cult. Trees, ed. 1, 777. 1927; Moldenke, Prelim. Alph. List Invalid Names 4 & 51. 1940; Rehd., Man. Cult. Trees, ed. 2, 805 & 994. 1940; Moldenke in Lundell, Fl. Texas 3 (1): 83. 1942; Moldenke, Alph. List Invalid Names 4 & 54. 1942; Rehd., Journ. Arnold Arb. 48: 258. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 1 & 29. 1947; Rehd., Bibl. Cult. Trees 585. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 133, 166, & 202. 1949.

Illustrations: C. K. Schneid., Illustr. Handb. Laubholz. 2: fig. 384 m-n. 1911.

This form differs from the typical form of the variety in having the leaflet-blades deeply pinnatifid, with the segments comparatively narrow, long, and remote.

Rehder cites E. H. Wilson 4308 for this form and regards it as typical of it.

Citations: CHINA: Hopeh: T. F. King 169 (S); Limpricht 2967 (S); H. Smith 922 (Go). Province undetermined: A. R. Schindler 140 [Yang Chia Ping] (S).

VITEX NEGUNDO var. INTERMEDIA (P'ei) Moldenke, *Revist. Sudam. Bot.* 5: 3. 1937.

Synonymy: Vitex negunda Mill., *Gard. Dict.*, ed. 8, no. 4. 1768 [not V. negunda Willd., 1832]. Vitex negundo f. intermedia P'ei, *Mem. Sci. Soc. China* 1 (3): 105--106. 1932. Vitex agnuscatus var. incisa Hort. ex Moldenke, *Prelim. Alph. List Invalid Names* 49, in syn. 1940. Vitex incisa Thunb. ex Moldenke, *Alph. List Invalid Names Suppl. 1*: 28, in syn. 1947 [not V. incisa Lam., 1738, nor Wall., 1895, nor Bunge, 1927].

Literature: Mill., *Gard. Dict.*, ed. 8, no. 4. 1768; Duby in *P. DC.*, *Bot. Gal.*, ed. 2, 1: 377. 1828; Franch., *Nouv. Arch. Mus. Paris*, sér. 2, 6: 112. 1883; P'ei, *Mem. Sci. Soc. China* 1 (3): 105--106. 1932; Moldenke, *Revist. Sudam. Bot.* 5: 3. 1937; Moldenke, *Geogr. Distrib. Avicenn.* 3, 9, 12, & 40. 1939; Moldenke, *Prelim. Alph. List Invalid Names* 49 & 51. 1940; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 5, 14, 28, 30, 55, 56, 58, 75, & 104. 1942; Moldenke in *Lundell, Fl. Texas* 3 (1): 82--83. 1942; Moldenke, *Alph. List Invalid Names* 51 & 54. 1942; Moldenke, *Phytologia* 2: 121. 1944; Moldenke, *Alph. List Invalid Names Suppl. 1*: 28. 1947; P'ei, *Bot. Bull. Acad. Sin.* 1: 5. 1947; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 10, 25, 45, 51, 57, 128, 133, 135, 166, & 202. 1949; Rehd., *Bibl. Cult. Trees* 584. 1949; Lombardo, *Invent. Pl. Cult. Montevid.* 235. 1954.

This variety differs from the typical form of the species in having the leaflet-blades more or less irregularly dentate or serrate with sparse teeth along the margins. It differs from var. cannabifolia (Sieb. & Zucc.) Hand.-Mazz. in its usually much sparser and more irregular teeth and the whitish or grayish-sordid under surface of the leaflets.

It is a mostly erect or spreading bush, shrub, or low tree, 1--5 m. tall, sometimes described as merely "semi-woody", the trunk to 15 cm. in diameter; branches and twigs slender, brownish or buff, rather acutely tetragonal, medullose, not lenticellate, rather densely short-pubescent or puberulent; nodes annulate; principal internodes 1.5--3.5 cm. long; leaves decussate-opposite, 3--5-foliolate; petioles slender, 4.5--6 cm. long, flattened and canaliculate above, rather densely short-pubescent or puberulent, slightly ampliate at the base, not noticeably disciform at the apex; leaflets subequal in size or the 2 lowermost somewhat smaller, all conspicuously petiolulate with petiolules 2--15 mm. long, margined, densely short-pubescent or puberulent like the petioles; leaflet-blades thin-chartaceous or submembranous, dark-green above (often nigrescent in drying), much lighter or sordid-gray beneath, the cen-

tral one oblong, elliptic, or lanceolate, 6--11 cm. long, 1.5--4.1 cm. wide, acutely attenuate or subacuminate at the apex, more or less irregularly dentate or serrate with scattered sparse teeth, acute or short-acuminate at the base, minutely puberulent or glabrous above, densely appressed-puberulous beneath (occasionally very sparsely and obscurely so on the lower lamina of old leaves), the lateral ones similar in all respects but usually smaller; midrib very slender, flat or subimpressed above, prominent beneath; secondaries very slender, 8--15 per side, arcuate-ascending, flat or subprominulous above, prominulous beneath, not plainly joined at the margins; vein and veinlet reticulation rather sparse and delicate, usually obscure or indiscernible on both surfaces, rarely plain beneath on older glabrescent leaves; inflorescence terminal, paniculate, simple or widely branched and thyrsoid, 17--42 cm. long, 3--15 cm. wide, each panicle (or branch) composed of numerous pairs of opposite distinctly stipitate cymes, the cymules mostly conspicuously brachiate with ascending and spreading very slender branches, few- or many-flowered, canescent or sordid throughout; bracts often one pair subtending each pair of lateral panicles in the terminal thyrse; bractlets linear, numerous, 2--8 mm. long; prophylla minute, linear or setaceous, 1 mm. long or less, canescent; peduncles 4.5--7 cm. long, slender, acutely tetragonal or flattened, brown, densely short-pubescent or puberulent with canescent or sordid hairs; rachis similar to the peduncle in all respects, the sympodia often elongate, especially the basal ones; flowers fragrant; calyx broadly campanulate, 2--3 mm. long, densely white-puberulent, its rim 5-toothed with long-apiculate teeth; corolla varying from blue or bluish to violet, lavender, purple, purplish, or whitish-blue, its tube about 3 mm. long, the limb 4--7 mm. wide; fruit green (when immature).

This plant has been found by collectors in dry places, open places, open waste places, open thickets, mixed woods, open brush, open valleys, and dry land at the sides of houses, on hillsides, mountains, and rocky slopes, near streams, by the ocean, and is said to be common in lowlands, abundant in sandy soil along roadsides, and common by roadsides, growing at altitudes from near sea-level to 1700 meters. It is occasionally planted in native yards in Annam, and is said to be used medicinally as a drug plant in China. It has been collected in anthesis from May to October and in December, and in fruit from August to October. One collector notes that the plant is "1 m. diam.", but what he means by this is not clear. The Runyon 65 collection, cited below, is anomalous in its very narrow and very long-petiollulate leaflets, a condition also approached on the Herb. Missouri Bot. Gard. no. 1025098 specimen. Juliana describes the petals as "yellow" and calls it "Potentilla", but surely in error. "Potentilla" is given as a common name for the plant, but this is probably based on this error on the part of Juliana.

It has been widely mis-identified in herbaria as Vitex agnus-castus L., V. agnus-castus var. latifolia Mill., Vitex

arguacustos L., V. bicolor Willd., V. incisa Lam., V. negundo L., V. negundo var. cannabifolia (Sieb. & Zucc.) Hand.-Mazz., V. negundo var. incisa (Lam.) C. B. Clarke, V. negundo var. incisa (Lam.) Garcke, and V. negundo var. typica H. J. Lam. Some botanists regard the Vitex spicata of Loureiro as representing this variety, rather than the typical form of the species. In the Linnean Herbarium at London sheet number 8 under genus 811 [790] is inscribed "Negundo" in the handwriting of Linnaeus himself and is probably to be regarded as the type of the species. The inflorescence is paniculate and its branches are very slender, but the leaflets are toothed more or less as in this variety. The picture on Curtis, Bot. Mag. 11: pl. 364 (1797) also somewhat resembles var. intermedia, but is cited by P'ei as what he called "var. incisa" rather than his f. intermedia, so I am also citing it under var. heterophylla (Franch.) Rehd. rather than here. None of the subspecific taxa in Vitex negundo is completely distinct from all the others, yet there are enough specimens of each that are sufficiently different from each other to make the subspecific epithets useful. The H. Smith 5597 collection was annotated by Handel-Mazzetti, for instance, as intermediate between f. intermedia and var. incisa.

It is very possible that Franchet's Vitex incisa var. heterophylla, published in Nouv. Arch. Mus. Paris, sér. 2, 6: 112 (1883) is the earliest name for this variety instead of for the var. incisa (Lam.) C. B. Clarke as maintained by Rehder. His original description seems to imply this, but I have not yet been able to examine his type specimen. If so, then "heterophylla" would become the correct varietal epithet for the taxon now under discussion and now called "intermedia", while Weston's "coerulea" would probably become the valid varietal epithet (and a most unfortunate one!) for the taxon now being called var. heterophylla.

The Duby collection cited below was actually the basis for his description of what he called Vitex agnus-castus in his Bot. Gal. 1: 377. The Herb. Miller s.n. at the British Museum is undoubtedly the type of Vitex negunda Mill., while the Herb. Hort. Bot. Berol. s.n. collection is the type of V. agnus-castus var. incisa Hort.

It seems most probable that the specimens of this variety cited below from Italy, Jugoslavia, and Turkey are from escaped and naturalized plants, as most certainly those from Florida, Cuba, St. Croix, and Trinidad are. The Peronin 196 collection from Turkey, however, has this comment on its label: "abondant au bord des marais d'Anaman. Août 1872". The Duss 2386 collection does not say if it came from a wild or cultivated plant, but I assume that it was cultivated. The Sieber Pl. Trinit. 320 collection says "introduit et cultivé". The McFarlin 6111 from Polk County, Florida, does not say cultivated on its labels and I am assuming that the plants were escapes.

Citations: FLORIDA: Polk Co.: McFarlin 6111 (I). CUBA: Havana:

Ordets 11689 (Rg). ST. CROIX: Benzon 94 (Cp). TRINIDAD: Sieber Fl. Trinit. 320 (Cb, V, V). ITALY: Van Heurck s.n. [prés Pisa] (Br). JUGOSLAVIA: Dalmatia: Wibbe s.n. (I). TURKEY: Peronin 196 (Vt). INDIA: Bangalore: Venkatesh s.n. [20th June 1944] (S). Bombay: Razi 9 (Xa); Santapau 23492 (Xa). East Punjab: Koelz 4592 (N). United Provinces: U. Singh 216 (Bz--24319). MANCHUKUO: Juliana s.n. (I). CHINA: Anhwei: Fan & Li 269 (Gg--310907); Sun 1390 (N). Fukien: Baker & Baker s.n. [Foochow, 11-1-1914] (Gg--31491); Chang & Metcalf 31 (Du--200918); Cheng 1014 (Bz--24331); Chung 5000 (N); En 2722 (Bz--24330); Ging 5161 (Gg--154278), 5245 (Gg--151546), 6695 (Gg--154441); Pi 6464 (Du--250166). Hopeh: Liou 1584 (N). Hupeh: Sun 10a (N), 769 (N), 859 (N); E. H. Wilson 1241 (N), 2702 (Gg--31494). Kiangsi: Chung & Sun 737 (N); Lau 3977 (S); Tsiang 9796 (N). Kwangsi: Ching 5450 (N); Fung 21196 (N); Morse 697 (N). Kwangtung: Armacost 6 (N); W. Y. Chun 3067 (N), 3173 (N), 6547 (Du--250173); Herb. Canton Chr. Coll. 12670 (S); S. Y. Lau 20133 (N); Levine s.n. [Herb. Canton Chr. Coll. 1420] (Ka--63095), s.n. [Herb. Canton Chr. Coll. 1585] (Ka--63247); Liou 1686 (N); T. K. Peng 485 [Herb. Canton Chr. Coll. 7122; 253.7186] (I); W. T. Tsang 21004 (N); Tsui 453 (Bz--24324, N), 617 (N); Ying 1263 (Bz--24329). Kweichow: Tsiang 5725 (N); Tsiang & P'ei 5725 (S). Shansi: H. Smith 5597 (Go), 6312 (Go). Shantung: Chiao 2705 (N, N); Zimmermann 442 (Br). Szechuan: Fang 4629 (Du--252637), 5624 (N); H. Smith 1749 (Go). Province undetermined: N. J. Andersson s.n. [China] (S, S); Dunn s.n. (Cp, Cp); Osbeck 11 (S). HONAI ISLAND: E. D. Merrill 10073 (Gg--31488). FORMOSA: Oldham 383 (C); Yamamoto 2369 (N). JAPAN: Honshiu: Herb. Mus. Stockholm s.n. [Kyoto, 5/9/13] (S). HONGKONG: W. Y. Chun 6548 (Du--250172). HAINAN ISLAND: Liang 62899 (N), 63036 (N); C. Wang 32749 (N). THAILAND: Zimmermann 2 (Br, S). SUMATRA: Bruimier 128 (Bz--24472). JAVA: Backer 21415 (Bz--24454, Bz--24455), s.n. [April 1903] (Bz--24453), s.n. [Juli 1903] (Bz--24444), s.n. [Aug. 1903] (Bz--24446), s.n. [Dec. 1903] (Bz--24450, Bz--24451, Bz--24452), s.n. [Batavia, 1910] (Bz--24448); Bakhuizen van den Brink 983 (Bz--24285, Bz--24286, Bz--24287), 1645 (Bz--24436, Bz--24437, Ut--24872a); Docters van Leeuwen-Reijnvaan 5 (Bz--24439). LESSER SUNDA ISLANDS: Banka: Berkhout 440 (Bz--24473). CULTIVATED: California: Walther 230 (Ba, Gg--170618, N--photo, Z--photo). Cuba: Acuffa 18499 (Es); J. G. Jack 8172 (A, N), 8357 (A, N). England: Herb. Miller s.n. (Em). France: Collector undesignated s.n. [22 Juillet] (Dc); Duby s.n. (M); Herb. J. Gay s.n. [Jard. M. Audibert, Sept. 1821] (K); Herb. Hort. Paris s.n. [Sept. 1823] (B). Germany: Herb. Hort. Bot. Berol. s.n. (B, B); Herb. Sprengel s.n. (B). Guadeloupe: Duss 2386 (N). Indochina: Clemens & Clemens 3804 (K). Java: H. Hallier s.n. (Bz--24440, Bz--24441); Herb.

Hort. Bot. Bogor. XVK.A.XLVI.11, in part (Bz--26461, Bz); Koorders 42747b (Bz--24463, Bz--24464); Van Steenis 2857 (Bz--24278); Zollinger s.n. [Java; Herb. Reichenb. f. 169007] (V). Kansas: F. C. Gates 15026, in part (M, Se--43245). Massachusetts: Rehder s.n. [Arnold Arb., Aug. 5, 1898], in part (E--116130). Missouri: Herb. Missouri Bot. Gard. s.n. [7/27/91] (E--116145), s.n. [1930] (E--1025098). Russia: Herb. Hort. Bot. Petropol. s.n. (K); Larson s.n. [Hort. Bot. Pawl. 1829] (Cp). Switzerland: Herb. Hort. Genev. s.n. (Dc); Rome s.n. [Aout 1877] (Cb). Texas: R. Runyon 65 (Ba, N--photo, W--1289650, Z--photo). Thailand: Kerr 4286 (K). Uruguay: Lombardo 7526 (N). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated s.n. (Cp); Herb. T. Anderson s.n. (Ol); Herb. Jewett s.n. (Mi, Mi). MOUNTED ILLUSTRATIONS: Fig. 1315 (N), 8667 (N).

VITEX NEGUNDO f. LAXIPANICULATA P'ei, Mem. Sci. Soc. China 1 (3): 104. 1932.

Literature: P'ei, Mem. Sci. Soc. China 1 (3): 104. 1932; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 57 & 104 (1942) and [ed. 2], 132 & 202. 1949.

This form differs from the typical form of the species in its large loose panicle, the elongated floral branches of which are about 20.5 cm. long, and in the upper surface of the leaflets being mealy-white, becoming glabrous in age. It is said to be a shrub about 6 feet tall, the flower purple or else "white or whitish". The form is based on Henry 13210 from Yuancheng, alt. 160 meters, and on Maire 6254 from the region of Kiao Kia, alt. 900 meters, collected in June, 1910, Yunnan, China.

VITEX NEGUNDO var. MICROPHYLLA Hand.-Mazz., Symb. Sin. 7: 906. 1936.

This variety differs from the typical form of the species in having almost all its leaves 5-foliolate, the leaflets 1--4 cm. long and entire, the secondaries 5 pairs, the inflorescence densely white-tomentellous, the corolla 5--8 mm. long, its tube 3 times as long as the calyx, densely short-pilose, the lower lip almost equaling the tube, the fruiting-calyx accrescent, its lobes acute, 2--3 mm. long, spreading, and the fruit densely short-pilose, much shorter than the fruiting-calyx.

The type of the variety was collected by Freiherr Heinrich von Handel-Mazzetti (no. 8781) at Ahsi on the Yangtze west of Lidjiang, northwestern Yunnan, China, at an altitude of 2050 meters, on May 29, 1916. Handel-Mazzetti cites also his no. 8006.

VITEX NEGUNDO var. SESSILIS Moldenke, Geogr. Distrib. Avicenn. 40, nom. nud. (1939); Am. Midl. Nat. 24: 754. 1940.

Literature: Moldenke, Geogr. Distrib. Avicenn. 40. 1939; Moldenke, Am. Midl. Nat. 24: 754. 1940; Moldenke in Lundell, Fl. Texas 3 (1): 83. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 104 (1942) and [ed. 2], 166 & 202. 1949.



This variety differs from the typical form of the species in having all of its 3--5 leaflets sessile, that is, without petioles. The corolla is said to be light-blue. The petiole is the normal length for the species.

The type of the variety was collected by J. H. Heuer at Chapman Field, Florida, from cultivated material, on August 27, 1931, and is deposited in the L. H. Bailey Herbarium at Ithaca, New York, and is Federal Plant Introduction no. 63649.

Citations: CULTIVATED: Florida: Heuer s.n. [F. P. I. 63649] (Ba--type, N--photo of type, Z--photo of type).

VITEX NEO-CALEDONICA Gandoger, Bull. Soc. Bot. France 65: 64. 1918.

Synonymy: Vitex neocaledonica Gandoger ex Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 151 & 202. 1949.

Literature: Gandoger, Bull. Soc. Bot. France 65: 64. 1918; Hill, Ind. Kew. Suppl. 6: 219. 1926; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 68 & 104 (1942) and [ed. 2], 151 & 202. 1949.

A tree; branchlets obscurely angular, tomentellous; leaves consistently 5-foliolate; leaflet-blades broadly ovate, acute at the apex, entire, truncate at the base, green and glabrous above, white-pulverulent beneath; inflorescence terminal, in loose corymbose racemes; pedicels short, slender, bracteolate; calyx-rim with minutely triangular-muticous teeth.

The species is based on an unnumbered collection of Debeaux from near Noumea, New Caledonia, and is known only from the original collection. It is said by Gandoger to be closely related to "V. negundo Willd.", but with leaflets that are shorter and not acuminate.

VITEX NLONAKENSIS Engl., Pflanzenw. Afr. 5 (1): 190, hyponym. 1925; Pieper in Fedde, Repert. 26: 162. 1929.

Literature: Engl., Pflanzenw. Afr. 5 (1): 190. 1925; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 43, 56, & 83. 1923; Pieper in Fedde, Repert. 26: 162. 1929; Hill, Ind. Kew. Suppl. 8: 219. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104 (1942) and [ed. 2], 114 & 202. 1949.

A tree, sparsely hairy or glabrous; branches scarcely angular, glabrous; leaves decussate-opposite; petioles 4--9 cm. long, glabrous; leaflets 3--5 in number, short-petiolate, the blades membranous or thin-coriaceous, obovate, acuminate at the apex, entire, cuneate at the base, 2--11 cm. long, 1--4 cm. wide, shiny above, glandular-foveolate beneath; midrib and secondaries slightly impressed above, acutely prominulous beneath, the secondaries rather straight, distinctly arcuate-joined near the margins; inflorescence axillary, loosely cymose, dichasially branched; peduncles 5--9 cm. long; bractlets linear, about 4 mm. long; calyx campanulate, about 4 mm. long, sparsely appressed-pilose, the hairs 2- or 3-celled, with a short 1- or 2-celled basal portion and a longer more or less thickened

terminal portion, the rim distinctly 5-toothed, glabrous within; corolla scarcely curvate, twice as long as the calyx, over 8 mm. long, its lobes conspicuously pilose, the tip of the upper lip to half as long as the tube, the tube less than 1 1/2 times the length of the calyx; ovary glabrous, slightly glandulose, round or ovate, not elongate.

The species is based on Ledermann 6135 from along the Nonako in the Cameroons, and is known only from the original collection.

VITEX OBANENSIS Wernham, Cat. Talbot's Nigerian Fl. 92. 1913.

Literature: Wernham, Cat. Talbot's Nigerian Fl. 92. 1913; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 42, 54, & 83. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 47 & 104 (1942) and [ed. 2], 113 & 202. 1949.

An almost glabrous shrub; branchlets fistular; leaves 5-foliate, long-petiolate; petioles 10--15 cm. long, very minutely puberulous; leaflets subequal, except for the two basal ones, their blades usually obovate, abruptly short-acuminate at both ends, rather scabrous above, glabrous beneath except for the minutely pubescent venation, glandulose, the terminal and lateral ones to 12 cm. long, almost 6 cm. wide, and with an acumen 1.5--2 cm. long, the basal ones 6.5--8.5 cm. long, 3--4.5 cm. wide, with an acumen 1--1.3 cm. long; petiolules of the 3 central leaflets rather long, that of the terminal one 1.3 cm. long, those of the 2 basal ones very short; inflorescence very lax, pedunculate, forming a terminal panicle, its main rachis over 20 cm. long, the lateral branches 10 cm. or more long, very minutely ferruginous-pubescent, not bracteate, the individual cymes 3- or 4-flowered; flowers small; pedicels 2--4 mm. long, pubescent; bractlets minute; calyx about 2 mm. long, 3 mm. wide at the flaring entire rim; corolla multiglandulose, its tube conspicuously curvate, about 5 mm. long, bent almost at right angles at the middle, much exerted from the calyx, the upper lobes short and very wide, the lower lip over 2 mm. long, ovate, with reflexed margins.

The type of this species was collected by Percy Amaury Talbot (no. 1044) at Oban, Northern Nigeria. The species is said to be closely related to V. thyrsoiflora J. G. Baker, differing in the shape of the leaflets and the lax character of the inflorescence. It is known thus far only from the original collection.

VITEX OBOVATA E. Mey., Comm. Pl. Afr. Austr. 1: 273. 1837.

Literature: E. Mey., Comm. Pl. Afr. Austr. 1: 273. 1837; Walp., Repert. 4: 87. 1844; Schau. in A. DC., Prodr. 11: 693. 1847; H. H. W. Pearson in Thiseit.-Dyer, Fl. Cap. 5: 212 & 214. 1901; Sim, For. Fl. Cape Colony 287, pl. 120. 1907; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 53, 74, & 83. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104 (1942) and [ed. 2], 122 & 202. 1949.

Illustrations: Sim, For. Fl. Cape Colony pl. 120. 1907.

A tree; young branches angular, with short internodes, finely tawny-tomentose, later glabrous and with prominent leaf-scars;

leaves decussate-opposite, 5- (or rarely 3-) foliolate; petioles 1--1.8 cm. long, tomentose; leaflet-blades coriaceous, subsessile or short-petiolulate, obovate or elliptic-obovate, 2.5--4.5 cm. long, 1--2.5 cm. wide, very short-apiculate at the apex, entire, cuneate at the base, pubescent or tomentose when young, especially along the midrib and margins, later finely puberulent beneath or entirely glabrous on both surfaces, profusely glandulose; secondaries 6--10 per side, obscure; cymes axillary, pedunculate, divaricate, about equaling the subtending leaves, bracteate, tomentose; bracts elliptic or oblong-linear, narrowed at the base into a short petiole, pubescent along the margins below the middle, glandulose, the lower ones 1--1.2 cm. long and 3--4 mm. wide; pedicels short, 2-bracteolate; calyx campanulate, subequally 5-lobed, its tube about 4 mm. long, 10-nerved, profusely glandulose and minutely pubescent outside, glabrous within, the lobes 1.5--2 mm. long and 2--2.5 mm. wide at the base, rounded or subacute at the apex, strongly 1-nerved, finely pubescent and glandulose; corolla mauvish-white, its tube about 8 mm. long, glabrous below the middle, finely puberulous and profusely glandulose outside above the calyx, pubescent within above the insertion of the stamens along 2 anterior parallel lines extending to the base of the anterior lobe, the lobes glandulose and finely pubescent on the back and along the margins, glabrous within, the posterior lobes reflexed; stamens inserted at about the middle of the corolla-tube, included; filaments villous, dilated toward the base; ovary globose-ovoid, glandulose and pubescent on the upper two-thirds; fruit drupaceous, obconic, short-apiculate due to the persistent base of the style, shorter than the accrescent fruiting-calyx, about 5 mm. long and 4 mm. wide at the apex, finely pubescent and glandulose.

The type of this species was collected by Johann Franz Drège in a valley near the Kei River, at an altitude of less than 1000 feet, Komgha Division, Cape of Good Hope. Flanagan says it is "very rare" at the type locality. It is found among rocks on hillsides and in valleys and ascends to 1500 feet between Komgha and the Kei River. It has been collected in anthesis in November.

Because of the difficulty in distinguishing this from some of its related species, it seems worthwhile to give here the keys, slightly modified, of previous monographers. Pearson distinguishes it thus:

1. Fruiting-calyx cupuliform, the rim minutely toothed.
  2. Leaves opposite; leaflet-margins usually serrate.....  
V. harveyana H. H. W. Pearson
  - 2a. Leaves ternate; leaflet-margins entire.....  
V. geminata H. H. W. Pearson
- 1a. Fruiting-calyx campanulate, the margin 5-lobed or -toothed.
  3. Adult leaflet-blades glabrous or glabrescent above.
    4. Petioles less than 1 inch long; leaflet-blades obovate or elliptic-obovate, less than 1 inch wide.....  
V. obovata E. Mey.

- 4a. Petioles about 1 inch long; leaflet-blades oblong-elliptic, less than 1 inch wide.....V. rehmanni Gürke.  
 4b. Petioles about 1 1/2 inches long; leaflet-blades oblong-elliptic or obovate, more than 1 inch wide.....  
V. wilmsii var. reflexa (H. H. W. Pearson) Pieper.  
 3a. Adult leaflet-blades tomentose or pubescent above.  
 5. Cymes surpassing the subtending petioles.  
 6. Leaflet-blades canescent or finely tomentose.....  
V. zeyheri Sond.  
 6a. Leaflet-blades lanate-tomentose on the larger veins beneath.....V. wilmsii Gürke.  
 5a. Cymes shorter than the subtending petioles.....  
V. pearsonii Pieper.

Pieper keys them apart thus:

1. Inflorescence longer than the subtending petioles.  
 2. Petioles short, only to 3 cm. long; leaflet-blades less than 2.5 cm. wide.  
 3. Leaflet-blades elliptic or lanceolate.  
 4. Leaflet-blades glabrous above, sparsely hairy beneath..  
V. rehmanni.  
 4a. Leaflet-blades sparsely canescent-tomentose above, more densely so beneath.....V. zeyheri.  
 3a. Leaflet-blades narrow-ovate or obovate, without plainly visible pubescence.....V. obovata.  
 2a. Petioles longer, more than 3 cm. long; leaflet-blades more than 2.5 cm. wide.....V. wilmsii.  
 1a. Inflorescence shorter than the subtending petioles.....  
V. pearsonii.

Citations: UNION OF SOUTH AFRICA: Cape of Good Hope: Drège s. n. [in a valley near the Kei River, below 1000 ft.] (N--photo of isotype, S--isotype, Z--photo of isotype); Flanagan 578 (N, N--photo, Na--6011, S--photo, Z--photo), s.n. [MacOwan 1515] (Vt). Natal: Gerstner 3706 (Gg--310877, N).

VITEX ODORATA Huber, Bol. Mus. Goeldi 5: 219--220, pl. 4, figs. 22 & 23. 1909.

Literature: Huber, Bol. Mus. Goeldi 5: 219--220, pl. 4, figs. 22 & 23. 1909; Stapf, Ird. Lond. 6: 479. 1931; Le Cointe, A. Amaz. Bras. III. Arv. e Pl. Uteis 429. 1934; Moldenke, Alph. List Common Names 24. 1939; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; Moldenke, Phytologia 2: 121. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 202. 1949.

Low tree; branchlets slender, grayish, obtusely tetragonal, short-pubescent with substrigose hairs, the younger parts and twigs very densely short-pubescent or subtomentellous with conspicuously flavescent-ochraceous or fulvous hairs; nodes not conspicuously annulate; principal internodes greatly abbreviated, 1 cm. or less in length; leaves decussate-opposite, 5-foliate; petioles slender, about 7.3 cm. long, densely short-pubescent with flavescent-ochraceous hairs, not ampliate at the base; petiohules obsolete or to 1 mm. long and densely short-pubescent

like the petioles; leaflet-blades membranous, dark-green above, brunnescenscent in drying, somewhat lighter beneath, very fragile, elliptic or very unequal, the central one to 15.5 cm. long and 6 cm. wide, usually more than twice as long as the lateral ones and more or less obovate, abruptly acute or obtusely short-acuminate at the apex, entire, long-acuminate at the base and cuneately prolonged into the petiole, rather sparsely puberulent above, densely short-pubescent or shortly fulvous-tomentose beneath, the lateral ones exactly similar or obovate-lanceolate and considerably smaller; midrib slender, plane or subimpressed above, rounded-prominent beneath; secondaries very slender, 7--15 per side, plane above, prominulent beneath, rather obscurely arcuate-joined at the margins; vein and veinlet reticulation rather sparse, indiscernible above, the larger portions subprominulent beneath; inflorescence axillary, sparse, cymose; cymes divaricate, dichotomously brachiate, with ascending branches, corymbose; peduncles very slender, 5--5.7 cm. long, densely short-pubescent with flavescent hairs; inflorescence-branches densely short-pubescent with flavescent hairs; bractlets linear, 5--8 mm. long, or the lowermost ones subfoliaceous, narrow-spatulate, and surpassing the flowers situated in the center of the first dichotomies; prophylla linear, 1--2 mm. long, densely short-pubescent with flavescent hairs like the bractlets; pedicels very slender, to 1 mm. long and flavescent-pubescent or obsolete; calyx campanulate, about 3 mm. long and wide, densely short-pubescent, its rim very shortly lobed, the lobes shortly semiorbicular, minutely apiculate; corolla hypocrateriform, its tube more than twice as long as the calyx, often to 1 cm. long, pubescent on the outside, ampliate above, its central inferior lobe greatly enlarged, about 7 mm. long, obovate, rounded-undulate at the apex, bearded at the base within, the 4 outer lobes much smaller, ovate, about 3 mm. long, obtuse; stamens and style exserted, the stamens protruding 3 and 4 mm. from the corolla-mouth, the filaments minutely puberulous; style projecting about 5 mm. from the corolla-mouth, glabrous; stigma bifid; fruiting-calyx and fruit not known.

The type of this endemic species was collected by Adolfo Ducke (no. 2522) on the campo at Chaves, Isla de Marajo, Amazonas, Brazil, on December 3, 1901, and is deposited in the herbarium of the Goeldi Museum at Belém. Huber states that the inflorescences of this species are more extensive than those of any other Amazonia species known to him at that time and that the flowers are pleasantly fragrant and attractive to insects. He says that because of its more or less persistent bracts this species approaches in appearance V. hypoleuca Schau. from Bahia and V. vauthieri P. DC. from Rio de Janeiro. He points out that the large leaves, sessile or subsessile leaflets, and the leaflet-blades being long-attenuate at the base are quite reminiscent of V. flavens H.B.K. Le Cointe, in the reference cited above, records the common name "tarumá cheiroso". Ducke calls it "petit arbre de campos"; Huber calls it "taruman cheiroso". Stapf dates the original publication as "1907--03", but it seems

actually to have been 1909.

Citations: MARAJO ISLAND: Ducke 2522 (Cb--isotype, F--601882--fragment & photo of type, N--fragment of isotype, N--photo of isotype, Z--photo of isotype).

VITEX ORINOCENSIS H.B.K., Nov. Gen. & Sp. Pl., ed. pict., 2: 200. 1818.

Literature: H.B.K., Nov. Gen. & Sp. Pl., ed. pict., 2: 200. 1818; Jacks., Ind. Kew. 2: 1214. 1895; Pittier, Supl. Plant. Usual. Venez. 54--55. 1939; Moldenke, Geogr. Distrib. Avicenn. 20. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 32 & 104. 1942; Pittier, La Mesa Guanipa 56. 1942; Moldenke, Phytologia 2: 121. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 65 & 202. 1949.

A small tree; branchlets and twigs rather slender, stramineous, obtusely tetragonal, lenticellate, the younger parts densely short- and appressed-puberulent with canescent hairs, the older parts becoming less so or even glabrescent; nodes not noticeably annulate; principal internodes 0.7--5.5 cm. long; leaf-scars rather corky and prominent; leaves decussate-opposite, uniformly 5-foliolate; petioles slender, 1--3.5 cm. long, convex beneath, conspicuously flattened above, puberulent with very short canescent hairs throughout, not noticeably ampliate at the base nor disciform at the apex; leaflets very unequal in size, the central one largest, the 2 lateral ones somewhat smaller, and the 2 lowest usually much reduced, the 3 middle ones petiolulate on very slender puberulent petiolules which are decidedly flattened and margined above, the 2 lowest sessile or subsessile; leaflet-blades very thin-chartaceous or submembranous, bright-green above, lighter beneath, not normally brunnescent in drying, the central one oblong-elliptic, elliptic, or subobovate, 5--11 cm. long, 2--4 cm. wide, acuminate at the apex and usually caudate (the acumination to 2.5 cm. long, bluntly acute or obtuse at the tip), entire, acute or acuminate at the base, often rather attenuate, glabrate above, obscurely puberulent beneath especially on the larger venation, the lateral ones similar but smaller and often less caudate at the apex and less attenuate at the base; midrib slender, mostly subimpressed above, prominent beneath; secondaries slender, numerous, close together, 11--13 per side, ascending, rather straight, not much or hardly at all arcuate except at the margins where they are rather obscurely arcuate-joined, flat or obscurely subprominent above, prominent beneath; vein and veinlet reticulation fine, abundant, usually subprominent on both surfaces; inflorescence axillary, cymose, 7.5--11 cm. long, 2.5--5.5 cm. wide, with about 4 main branches emerging in subumbellate fashion at one point, ascending-divaricate, each 2--4 cm. long and again once or twice furcate and rather many-flowered; peduncles slender, conspicuously flattened, 5--6 cm. long, densely short-puberulent like the twigs and petioles; bracts none; bractlets few, linear, 2--3 mm. long, puberulent; prophylla minute, linear, to 1 mm. long, puberulent; pedicels pubescent; calyx campanulate, pubescent, its

rim obsolete 5-toothed; corolla blue or bluish, resembling that of V. agnus-castus L. in size, its tube ampliate above, its limb 2-lipped, the upper lip bifid, the lower lip trifid, the lower middle lobe largest, subcordate, undulate-crenulate along the margins, white-spotted and barbate at the base; fruiting-calyx and fruit unknown.

The type of this species was collected by Aimé Jacques Alexandre Bonpland (no. 832; Herb. Willdenow 11704) at Boca de Meta, the junction of the Río Meta and Río Orinoco, Amazonas, Venezuela, and is deposited in the Humboldt and Bonpland Herbarium at the Muséum National d'Histoire Naturelle in Paris. Pittier, in his 1942 publication cited above, records the common name "tasaajo", and says "arbol de copa redonda, las flores azulejas en panículas cortas y densas. Santa Rosa." The species is said to inhabit clear forests, blooming in April. The Spruce 3653 sometimes cited as this species, is actually var. multiflora (Miq.) Huber.

Citations: VENEZUELA: Amazonas: Bonpland 832 [Herb. Willdenow 11704; Macbride photos 39495] (E--photo of type, F--1038374--photo of type, Kr--photo of type, N--photo of type, N--photo of type, P--type, Z--photo of type). Guárico: H. Pittier 12356 (A, Cb, F--615513, Mu, N, N, Ve--12849, W--1344383).

VITEX ORINOCENSIS var. GLABRA Moldenke, Phytologia 4: 293--294. 1953.

This variety differs from the typical form of the species in having its leaflet-blades completely glabrous on both surfaces.

The type of the variety was collected by Elbert Luther Little, Jr., and Ruby Rema Little (no. 8286) in cleared riverbottom forests of the Río Meta at Puerto López, Meta, Colombia, at an altitude of 240 meters, on July 28, 1944, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is known thus far only from the type collection.

Citations: COLOMBIA: Meta: Little & Little 8286 (N--type, N--isotype).

VITEX ORINOCENSIS var. MULTIFLORA (Miq.) Huber, Bol. Mus. Goeldi 5: 217. 1909.

Synonymy: Vitex multiflora Miq., Linnaea 18: 739. 1844. Vitex orinocensis var. amazonica Huber, Bol. Mus. Goeldi 5: 217, pl. 3, figs. 19 & 20. 1909. Vitex orinocoensis var. multiflora (Miq.) Huber ex Moldenke, Alph. List Invalid Names Suppl. 1: 29, in syn. 1947.

Literature: Miq., Linnaea 18: 739. 1844; Huber, Bol. Mus. Goeldi [Mus. Para.] 5: 217, pl. 3, figs. 19 & 20. 1909; Le Cointe, A Amaz. Bras. III. Arv. e Pl. Uteis 429. 1934; Moldenke, Alph. List Common Names 29 & 31. 1939; Moldenke, Geogr. Distrib. Avicenn. 19--22, 24, 27, & 40. 1939; Moldenke, Prelim. Alph. List Invalid Names 51. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 31--33, 35, 39, 75, & 104. 1942; Moldenke, Alph. List Invalid Names 54. 1942; Moldenke, Phytologia 2: 121. 1944; Le Cointe, O Estado Para 241. 1945; Moldenke, Alph. List

Invalid Names Suppl. 1: 29. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 62, 65, 67--69, 74, 95, 166, & 202. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949; Lindeman, Veget. Coast. Reg. Suriname 116 & 118. 1953.

Illustrations: Huber, Bol. Mus. Goeldi 5: pl. 3, figs. 19 & 20. 1909.

This variety differs from the typical form of the species in having gray and stouter branchlets, with more uniformly shorter internodes, the twigs dark-brown when dry, the leaflets varying from 1 to 5 in number, mostly 3, very shortly and obtusely acuminate or acute at the apex, mostly all petiolulate, often brunnescenscent in drying, the young ones nigrescent, the vein and veinlet reticulation often obscure beneath, and the inflorescence not at all umbelloid, but widely dichotomous-brachiate, to 20 cm. long and 12 cm. wide. Bracts are also often present at the lowest furcations and are oblanceolate or spatulate, foliaceous, long-stipitate, and to 1.5 cm. long.

A low spreading or medium-sized tree, or large and handsome and to 30 m. tall, often with many trunks and an irregular rounded crown; trunks to 22.5 cm. in diameter at breast height; branches ascending; wood hard; the gray branchlets and dark-brown twigs rather stout, the younger parts densely short-puberulent with appressed canescent hairs, the older parts glabrescent; principal internodes usually abbreviated, occasionally elongated to 4 cm. on vigorous shoots; leaves decussate-opposite, 1--5-foliolate, mostly 3-foliolate; petioles slender, 1--3.5 cm. long or to 6 cm. long on shoots, puberulent with short canescent hairs throughout; leaflets unequal, mostly all very short-petiolulate or the central petiolule to 8 mm. long, deeply canaliculate and margined on shoots; leaflet-blades membranous or thin-chartaceous, becoming thick-chartaceous at time of fruiting, often brunnescenscent in drying, the young ones nigrescent, the central one oblong-elliptic, elliptic, or subobovate, 5--11 cm. long, 2--4 cm. wide (or to 16 cm. long and 8 cm. wide on vigorous shoots), very shortly and obtusely acuminate or acute at the apex, entire, acute or acuminate at the base, glabrous or subglabrate above, obscurely puberulent beneath (especially on the larger venation), the lateral ones similar in all respects, but smaller; midrib very slender, flat above, prominent beneath; secondaries very slender, close together, numerous, 8--15 per side, rather straight and ascending, arcuately joined at the margins beneath, flat above, prominulous beneath; vein and veinlet reticulation abundant and fine, mostly obscure on both surfaces; inflorescence axillary, cymose, widely dichotomous-brachiate, to 20 cm. long and 12 cm. wide; peduncles slender, conspicuously flattened, 5--10.7 cm. long, densely short-puberulent; bracts often present at the lowest furcations, oblanceolate or spatulate, foliaceous, long-stipitate, to 1.5 cm. long; bractlets and prophylla linear or setaceous, 1--2 mm. long, densely puberulent; flowers showy, fragrant, readily falling; calyx short-campanulate, about 1 mm. long, appressed-puberulent, its rim obscurely 5-toothed with very small unequal



teeth; corolla varying from blue, bright-blue, sky-blue, or blue-violet to lilac, violet, purplish-pink, or purple, hypocrateriform, its tube about 4 mm. long, more or less densely appressed-puberulent outside, its lobes densely puberulent outside, obscurely pulverulent on the inner surface, the inferior median lobe much larger and darker than the others, yellowish and barbulate at the base; stamens and style somewhat exserted; fruiting-calyx patelliform, about 4 mm. wide, very minutely puberulent, its rim subentire; fruit drupaceous, oblong-obovate, about 8 mm. long and 6 mm. wide, nigrescent.

The type of this variety was collected on banks of a stream near Victoria Station, Surinam, in December, 1943, by August Kappler (no. 1366), although some labels of this collection give the margins of woods on the Marowyne in July as the place and time of collection. The collection is also sometimes cited as "Hostmann & Kappler 1366", because some labels are thus inscribed. The var. amazonica was based by Huber on his no. 3007 from Marajo Island, collected in November, 1902, and on no. 434 cultivated at the Horto Botanico in Belém and collected on September 7, 1896, but originally also procured from Marajo Island. The only fruiting specimens known so far are Jenman 6913, Cuatrecasas 4150, and J. G. Kuhlmann s.n. [Herb. Rio de Janeiro 22526]. Especially large-leaved specimens are represented by Bailey & Bailey 203 and Herb. Rio de Janeiro 2316.

The variety has been collected in anthesis in every month of the year except September, and in fruit in October and November. It has been confused by herbarium workers with V. divaricata Sw. and V. cymosa Bert. Its wood is used in home and industrial construction, according to Le Coite, who records "tarumá frondoso" as a common name. Williams states that it is used for making fenceposts in Venezuela. It is said to inhabit light forests, the edges of woods, non-inundated land, savannas, swampy places, granite, and the sides of streams. Pittier describes it as a tree of the lower forest belt in Aragua, Venezuela. Haught says it is abundant in the forests of Meta, Colombia. Hohenkerk states that the flowers are "heliotrope to lilac in color, in bunches covering large portions of the tree-top". Some collectors describe the tree as low in stature, with many trunks and a rounded crown, growing on terra firma, while Huber says it is a large tree growing in the "islands" of forest on otherwise open campos.

The variety ranges from Colombia through Venezuela and the Guianas to Brazil and Amazonian Peru, ascending to 500 meters altitude. Common names include "laesi kabbassi", "guarataro", "kalebashout", "tarumá", "tarumã", "tarumá frondoso", "tarumá frondoso", "taruman", "taruma preto", "totumillo", "totumillo blanco", "turaru", and "turarú". Ducke says "floribus lilacinis cum albo". The inflorescence is very different from that of the true V. orinocensis H.B.K. and it should probably be regarded, as Miquel originally maintained, as a distinct species. The Spruce 3653 collection, often labeled as from Brazil, was actu-

ally collected in Venezuela according to Spruce's own notes. The date for Huber's publication is given by Stapf as "1907--08", but appears actually to have been 1909.

Citations: COLOMBIA: Amazonas: R. E. Schultes 6880 (W--1986641). Caqueta: Ducke 1846 [Herb. Rio de Janeiro 60345] (Be--12478, N, N, W--1906577). Magdalena: Goudot B (K, P). Meta: Cuatrecasas 4150 (Jc); Haught 2818 (Gg--310878, N). Santander: Haught 2199 (N). Vaupés: Cuatrecasas 7764 (W--1774229). Department undetermined: Fior. Claes s.n. (Br). VENEZUELA: Amazonas: Holt & Blake 679 (N, S, W--1519285); Karsten s.n. [San Carlos] (V); Spruce 3653 (B, Em, Br, Cb, Cb, Ed, F--876697, G, K, K, N, P, V, X); Ll. Williams 15177 (F--1189149, N, Ve--12379, W--1879671). Bolívar: Ll. Williams 13295 (N). Carabobo: Saer 802 (N, Ve--12372, W--1804152). Cojedes: H. Pittier 11682 (A, B, Cb, K, Mu--4379, N, Ve, W--1232589). Federal District: Loritz 1488 (B, Em), 1726 (Bm). Guárico: Christ 3 (N, Ve, W--1233196); H. Pittier 11797 (A, B, Cb, D--630276, K, Mu--4380, N, W--1233208). Lara: Saer 422 (F--694167, F--727279, Ve). Miranda: Delgado 331 (Ve--12867, W--1833773); Tamayo 1505 (Ca--734741, Ve--12373, W--1800893). Monagas: Aristeguieta 1727 (N). State undetermined: Chardon 57 (Ve--12877). BRITISH GUIANA: Herb. Forest Dept. Br. Guian. F.647 [31a] (N); Hohenkerk 647 (K); Jenman 6918 (K); Schomburgk 206.5 (K). SURINAM: B.W., Bureau of Forestry 503 (Ut); Hostmann & Kappler 1366 (B--isotype); Kappler 1366 [Macbride photos 17562] (B--isotype, Cb--isotype, Dr--isotype, E--116174--isotype, F--663091--photo of isotype, Gt--isotype, Gt--isotype, Kr--photo of isotype, Le--type, Mu--1180--isotype, N--photo of isotype, N--photo of isotype, P--isotype, S--isotype, Us--isotype, Us--isotype, V--isotype, V--isotype, V--isotype, X--isotype, X--isotype, Z--photo of isotype), 1988 (Gt, S, Ut); Pulle 215 (Ut), 455 (Ut); Rombouts 645 (Ut), 676 (Ut); Wullschlägel 1036 (Br). FRENCH GUIANA: Brousseau s.n. [22 Août 1890] (P, P, P, P, P, P, P, P); Mélinon 197, in part (Bz--24260, Cb, K, P, P, W--1112703), 386 (F--539852, G, K, N, P, P, P, W--1123379); Sagot 1013 (B, Em, K, P, P, P, P, S, V). PERU: Loreto: J. G. Kuhlmann s.n. [Herb. Rio de Janeiro 22526] (B, W--1517708). BRAZIL: Acre Territory: J. G. Kuhlmann s.n. [Herb. Rio de Janeiro 22525] (S, Ut). Amazonas: Ducke 1845 [Herb. Rio de Janeiro 60344] (Be--12494, N, N, W--1906576). Maranhão: Fróes 9 (W--1617854), 12 (W--1617857), 1952 (A, B, Cb, E--1042144, N, P, S, Ut). Pará: Ducke s.n. [Herb. Rio de Janeiro 15137] (Em, Cb, P, W--1040624), s.n. [Herb. Rio de Janeiro 15593] (Em, Cb, W--1040675), s.n. (Ja--5469); Herb. Amaz. Mus. Para. 10753 (Bm, Cb, N, P, W--1040494); Huber s.n. [Herb. Rio de Janeiro 2163] (B); Lutz 9473 (Bm, Ut). MARAJÓ ISLAND: Huber 3007 (Bm, Cb, Cb, E--photo, F--601816--fragment & photo, N--photo, W--1040311, Z--photo). CULTIVATED: Brazil: Archer 7722 (N); Bailey & Bailey 203 (Ba); Ducke 836 (N); Huber 484 (F--

601802--fragment & photo). LOCALITY OF COLLECTION UNDESIGNATED: Herb. Jard. Bot. Brux. s.n. (Br, Br); Herb. Martius s.n. (Br).

VITEX OSCITANS Moldenke, Phytologia 3: 443--444. 1951.

Shrub or tree; branchlets stoutish, grayish, densely puberulent on the younger parts; principal internodes apparently rather short, 1.5--2 cm. long; leaves decussate-opposite, 1-foliate; petioles stout, 1.6--2 cm. long, very minutely puberulous or glabrescent, swollen at the apex; blades coriaceous, rather uniformly bright-green on both surfaces, very shiny beneath, broadly elliptic or obovate, 11--14 cm. long, 6--8 cm. wide, varying from subtruncate or rounded at the apex to very shortly apiculate, entire, usually somewhat revolute at the margins in drying, cuneate-acute or short-acuminate at the base, glabrous (or practically so) on both surfaces, obscurely impressed-punctate beneath; midrib coarse, flat above, very prominent toward the base beneath, rapidly diminishing in size as the apex is approached beneath; secondaries very slender, 7--9 per side, flat and mostly obscure above, prominulous beneath, divaricate-ascending, often furcate and irregularly anastomosing in many loops near the margins beneath; veinlet reticulation indiscernible above, only the larger parts prominulous beneath; inflorescence axillary, cymose, few-flowered, about equaling the subtending petioles; peduncles flattened, about 5 mm. long, densely appressed-pubescent with short cinereous hairs; cyme-branches and pedicels slender, 2--4 mm. long, densely appressed-puberulent with antrorse whitish hairs; bractlets rather large and conspicuous, spatulate, about 5 mm. long, stipitate, about 3 mm. wide at the apex, glabrous and brunnescent on one surface, the other surface densely appressed-puberulent with antrorse cinereous hairs; calyx campanulate, 5--6 mm. long and wide, very densely short-pubescent with appressed cinereous hairs outside, glabrous within, its rim often flaring, 5-toothed, the teeth broadly triangular-ovate, 1.5--2 mm. long, attenuate-acute or cucullate-apiculate at the apex; corolla infundibular, short and broad, densely villous-hirsute on the outside, more densely so toward the apex, with long sordid-brownish hairs, the tube 1--1.3 cm. long, 7--8 mm. wide at the apex, the limb rather deeply lobed, the upper lip firm or arched, the others spreading-reflexed, 4--5 mm. long; stamens and pistil surpassing the corolla-mouth by about 1 cm.; filaments pilosulous on the exerted portion; anthers about 1.5 mm. long, the 2 thecae often twisted; style glabrous, bifid at the apex.

The type of this endemic species was collected by M. Louvel (no. 81) at Tampina, Madagascar, in July, 1925, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. It is known thus far only from the original collection. A vernacular name for the plant is "fandrianagoaka".

Citations: MADAGASCAR: Louvel 81 (N--isotype, N--photo of type, P--type, Z--photo of type).

VITEX OXYCUSPIS J. G. Baker in Thistelt.-Dyer, Fl. Trop. Afr. 5: 326--327. 1900.

Literature: J. G. Baker in *Thiselt.-Dyer*, Fl. Trop. Afr. 5: 326--327. 1900; Hiern, *Cat. Afr. Pl. Welw.* 1 (4): 838. 1900; Pieper in *Engl., Bot. Jahrb.* 62, *Beibl.* 141 ["142"]: 43, 56, & 84. 1928; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 46, 47, 51, & 104. 1942; Moldenke, *Phytologia* 2: 121. 1944; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 112, 113, 119, & 202. 1949.

A small tree, to 6.5 m. tall; branchlets glabrous; leaves 3--5-foliolate; petioles 5--7.5 cm. long; leaflet-blades membranous, green on both surfaces, obovate-cuneate, irregularly but distinctly crenate, distinctly petiolulate, with a large linear cusp at the apex, glabrous on both surfaces, the central one 15--20 cm. long and less than half as wide; inflorescence axillary, cymose, long-pedunculate, lax, the branches glabrous; calyx campanulate, about 1 mm. long, glabrous, its rim with short deltoid teeth; corolla about 3 times the length of the calyx, glabrous; fruit not known.

The type of this species was collected by Gustav Mann (no. 2243) along the Old Calabar River in Southern Nigeria. Baker states plainly that the calyx is glabrous, but Pieper in his key says for the species "*Kelchhaare abstehehend*". Hiern and Pieper both cite *Welwitsch 5671* from the Quetta Mountains, Golungo Alto, Angola. Vernacular names for the plant are "fevei", "kparseh", and "kisengi".

Citations: LIBERIA: G. P. Cooper 321 [*Mus. Yale School Forest.* 15228] (N). BELGIAN CONGO: *Vanderyst 8154* (Br).

VITEX PACHYCLADA J. G. Baker, *Journ. Linn. Soc. Lond.* 20: 227--228. 1883.

Literature: J. G. Baker, *Journ. Linn. Soc. Lond.* 20: 227--228. 1883; Pieper in *Engl., Bot. Jahrb.* 62, *Beibl.* 141 ["142"]: 76, 79, & 84. 1928; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 53 & 104 (1942) and [ed. 2], 123 & 202. 1949.

A much-branched shrub; branches and branchlets rather stout, obtusely tetragonal, gray, very densely fulvous-villosulous on the younger parts, glabrescent in age; nodes not annulate; principal internodes 5--13 mm. long; leaf-scars comparatively small, not prominent; leaves decussate-opposite, 3-foliolate; petioles rather stout, 2.5--4.3 cm. long, very densely fulvous-tomentelous or villosulous; petiolules stout, those on the lateral leaflets 1--4 mm. long, those on the central leaflet 6--10 mm. long, all densely fulvous-villosulous; leaflet-blades thick-coriaceous, obovate, gray-green above, fulvous beneath, 3--8.5 cm. long, 2.3--5 cm. wide, very obtuse or rounded at the apex, entire and somewhat revolute-margined, very obscurely subpuberulous or glabrescent above, very densely fulvous-tomentose or lanuginous beneath, the pubescence often bright-brown; midrib slender, flat above, prominent beneath, rapidly diminishing in size as the apex is approached; secondaries slender, 4--6 per side, divaricate-ascending, hardly arcuate, flat above, prominulous but hidden by the tomentum beneath; veinlet reticulation abundant, mostly indiscernible above, prominulous but hidden by

the tomentum beneath; inflorescence axillary, 6--8-flowered, congested, shorter than the subtending petioles; peduncles very short, 2--3 mm. long, densely fulvous- or brown-villous; pedicels (in fruit) stout, 2--5 mm. long, densely fulvous- or brown-villous or lanuginous; flowers not known; fruiting-calyx incrassate, cyathiform, 6--7 mm. long and wide, densely fulvous-villous, the hairs wearing off toward the rim, the teeth minute, broadly deltoid, much wider than long; fruit drupaceous, bright-brown, globose, about twice as long as the calyx, usually about 1 cm. long and 6--7 mm. wide, the pericarp much wrinkled in drying.

The type of this endemic species was collected by Richard Baron (no. 1471) in the forest at Amparimpotsy, in central Madagascar, in or before October, 1882, and is deposited in the herbarium at the Royal Botanic Gardens at Kew.

Citations: MADAGASCAR: Baron 1471 (K--type, N--isotype, N--photo of type, Z--photo of type), 4516 (K).

VITEX PACHYPHYLLA J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 328. 1900.

Literature: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 328. 1900; A. Chev., Vég. Util. Afr. Trop. Franç. 9: 281, pl. 25. 1917; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 51, 71, & 84, pl. 11. 1928; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104. 1942; Quint, Govt. French Equat. Afr. Forest. Dept. Notice 4. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 114 & 202. 1949.

Illustrations: A. Chev., Vég. Util. Afr. Trop. Franç. 9: pl. 25. 1917; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: pl. 11. 1928.

A tree, 25--30 m. tall; trunk 60--90 cm. in diameter, branchless for 15--20 m. from the base, thinly buttressed at the base; wood grayish-white, the sap- and heartwood not differentiated; bark pinkish-white, peeling off in small scales 3--4 mm. thick; branchlets glabrous; leaves 5-foliolate; petioles 5--7.5 cm. long; leaflet-blades very thick and rigid, obovate-cuneate, green and glabrous on both surfaces, obtuse or acute at the apex, entire, distinctly petiolulate, the central one 10--12.5 cm. long and 5--6.2 cm. wide, the larger venation very prominent beneath; cymes axillary, long-pedunculate, many-flowered, dense, their branches pubescent; calyx campanulate, about 3 mm. long, pubescent, the teeth very small; corolla small, silky on the outside; fruit the size of a small plum (Prunus domestica).

The type of this species was collected by Gustav Mann (no. 994) on the banks of the Gaboon River, Gabun, French Equatorial Africa. Chevalier, in the reference cited above cites his nos. 26661 and 26669, also from Gabun, and records the common names "angona" and "evino". He says the species is a handsome tree reminiscent of the gray walnut. It is exported to Europe and he says it is common in the region of Lake Oghémoué and Lake Fernan-Vaz and in the environs of Libreville and Sibange. The wood is

"bien maillé".

Citations: FRENCH EQUATORIAL AFRICA: Gabun: Klaine 794 (F--photo, N, N--photo, S, Sg--photo, Z--photo).

VITEK PADANGENSIS H. Hallier, Meded. Rijks Herb. Leid. 37: 46--47. 1918.

Literature: H. Hallier, Meded. Rijks Herb. Leid. 37: 46--47. 1918; H. J. Lam, Verbenac. Malay. Arch. 169, 213, & 370. 1919; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 63 & 104 (1942) and [ed. 2], 143 & 202. 1949.

A tree; branchlets tetragonal, ferruginous-tomentose or ochraceous-tomentose, becoming glabrescent; leaves 3--5-foliolate; petioles 5--12 cm. long; leaflet-blades "coriaceo-membranous", dark purple-violet beneath, lanceolate, cuspidate-acuminate at the apex, acute at the base, glabrous and glandulose on both surfaces except on the puberulous venation, the central one 11--17 cm. long, 5--6 cm. wide, and on petiolules 2--3 cm. long, the lower leaflets often unequal at the base and shorter-petiolulate; panicles terminal, thyrsoid, 20--25 cm. long, with 2--6 decussate branches, ferruginous- or ochraceous-tomentose; flowers unknown; fruiting-calyx patelliform, about 11 mm. in diameter, puberulous outside, glabrous and violet within, its rim shortly and irregularly 5-lobed; fruit drupaceous, ellipsoid, black, about 2 cm. long and 1 cm. wide, apiculate, glabrous.

The species is based on Korthals s.n. from near Nangallo, Padang, western Sumatra, and Beccari 726 from Ajer Mantjur, altitude 360 meters, western Sumatra, collected in August, 1878.

VITEK PANSHINIANA Moldenke, Geogr. Distrib. Avicenn. 27, nom. nud. 1939; Trop. Woods 64: 36--37. 1940.

Literature: Turcz., Bull. Imp. Soc. Nat. Mosc. 36 (2): 225. 1863; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Trop. Woods 64: 36--37. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 74. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 202. 1949.

Tree, to 20 m. tall, with a rounded crown; branches very stout and woody, with corky bark, very obtusely tetragonal, gray-brown, puberulent on the younger parts and nodes or glabrous; branchlets similar but usually more acutely tetragonal and densely tomentose-pubescent with ferruginous tomentum; twigs stout, usually short, usually more acutely tetragonal, very densely villous-tomentose or hirsute with long and shaggy flavescent or ferruginous hairs; nodes somewhat suberose-annulate, but usually not conspicuously so; principal internodes 1--4 cm. long, or very much more abbreviated on branchlets and twigs; leaves decussate-opposite, 5-foliolate; petioles stout, 7--13.5 cm. long, flattened above, very densely villous-tomentose or hirsute with long and shaggy flavescent or ferruginous hairs, slightly or hardly at all ampliate at the base, somewhat disciform at the apex; leaflets usually unequal in size, the 2 lowermost considerably smaller than the 3 central ones, all subsessile or petiolulate with peti-

olules to 7 mm. long and shaggy-villous like the petioles; leaflet-blades submembranous, dark-green above, much lighter and yellowish beneath, the central one elliptic or varying to subobovate or oblanceolate, 10.5--19 cm. long, 3.2--5.6 cm. wide, acute at the apex, entire (or slightly undulate-repand), rather long-attenuate or cuneate at the base, densely villous or villous-tomentose above, very densely matted-tomentose and velutinous on the lamina beneath and villous on the larger venation, the hairs flavescent or ferruginous, the lateral leaflets similar but smaller, usually less distinctly petiolulate, and less attenuate at the base; midrib slender, flat above but conspicuous by being much less densely silky-villous, prominent and densely ferruginous-villous beneath; secondaries slender, 14--17 per side, arcuate-ascending, flat above, slightly prominent beneath, rather obscurely joined at the margins beneath; vein and veinlet reticulation abundant, mostly indiscernible above, rather conspicuously sunken in the tomentum of the lamina beneath; inflorescence axillary, cymose, often somewhat subcapitate, 2--7.5 cm. long, 1.5--4.5 cm. wide, many-flowered, rather dense, usually more or less branched in a subumbelloid fashion, densely flavescent-villous throughout; peduncles rather stoutish, 1--6 cm. long, densely flavescent- or ferruginous-villous with shaggy or spreading hairs like the petioles, usually somewhat flattened; pedicels obsolete or to 3 mm. long and densely villous, obscure; bractlets linear or spatulate, to 1 cm. long, densely villous-tomentose; prophylla linear, 1--3 mm. long, tomentose; calyx cyathiform, heavy, 4--5 mm. long, about as wide as long, densely fulvous-tomentose on the outer surface, pubescent within, its rim deeply 5-lobed, the lobes ovate, 1 mm. or more long, often widely divergent or reflexed, acute; corolla hypocrateriform, varying from blue or lilac to light-violet or violet, its tube broadly cylindrical, about 7 mm. long, densely tomentose on the outside, the limb conspicuously 2-lipped, the 4 smaller lobes oblong-ovate, about 4 mm. long, obtuse, the central lower lobe much enlarged, about 8 mm. long, rounded; stamens and style somewhat exerted; fruiting-calyx and fruit not seen, but the fruit described as red or purple, turning black, drupaceous, sweet.

The type of this handsome species was collected by George Gardner (no. 1817) in woods around Crato, Ceará, Brazil, in September, 1838. The collector describes it as "a large tree, common in the woods.....flowering before the leaves are expanded." Some of the labels on the type collection are inscribed "1839", but a label in Gardner's own handwriting at Kew definitely states that the collection was made in September of 1838. The young leaves remind one by their pubescence of V. regnelliana Moldenke and of V. polygama var. warmingii Moldenke. It has been confused in the past with V. polygama Cham. and V. flavens H.B.K. It is said to inhabit campos and woods, blooming in September. Turczaninow, in the reference cited above, points out that the type collection belongs in section Euagnus rather than in the section with V. polygama. It is named in honor of

Alexis John Panshin (1901--), wood anatomist of note.

Citations: BRAZIL: Ceará: G. Gardner 1817 [Macbride photos 34304] (Em--isotype, F--976259--photo of isotype, G--isotype, K--isotype, K--isotype, Kr--photo of isotype, M--isotype, N--type, N--photo of isotype, P--isotype, P--isotype, V--isotype, V--isotype, V--isotype, W--1066684--isotype, X--isotype); Luetzburg 12524 (Mu), 25863 (Mu), 26170 (Mu, N--photo, Z--photo). Pará: Frões 30570 (Z); Rumbelsberger s.n. [Herb. Rio de Janeiro 5967] (N); Sampaio 5662 (Ja--19244); Traill 671 (K, N). State undetermined: Freire Allemão s.n. (Ja--5962).

VITEX PANSHINIANA var. PULCHRA Moldenke, Geogr. Distrib. Avicenn. 27, nom. nud. 1939; Trop. Woods 64: 38. 1940.

Literature: Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Trop. Woods 64: 38. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104 (1942) and [ed. 2], 95 & 202. 1949.

This variety differs from the typical form of the species in its subcoriaceous mature leaflets (at time of anthesis) which are distinctly impressed-reticulate above and somewhat more shortly pubescent on the lamina above rather than long-villous. The uppermost leaves are very immature at time of anthesis, as in the species proper, but immediately below the inflorescence are fully matured leaves which are subcoriaceous in texture rather than submembranous as in the typical form of the species and are subsessile.

The type of the variety was collected by Alberto Löfgren (no. 349) as São Benedicto, Ceará, Brazil, on March 18, 1910, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. It was originally confused by Fries with V. polygama Cham., which it resembles only superficially in foliar characters. It is known only from the type collection.

Citations: BRAZIL: Ceará: Löfgren 349 (N--isotype, N--photo of type, S--type, Z--photo of type).

VITEX PARVIFLORA A. L. Juss., Ann. Mus. Hist. Nat. Paris 7: 76. 1806.

Synonymy: Vitex littoralis Decne., Nouv. Ann. Mus. Paris 3: 401. 1834 [not V. littoralis A. Cunn., 1838]. Vitex altissima Blanco, Fl. Filip., ed. 1, 516. 1837 [not V. altissima L. f., 1781, nor Moon, 1824, nor Roxb., 1829, nor L., 1955, nor Heyne, 1955]. Vitex geniculata Blanco, Fl. Filip., ed. 1, 514, in part. 1837. Vitex latifolia Blanco, Fl. Filip., ed. 1, 514, in part. 1837 [not V. latifolia Mill., 1768]. Vitex altissima Naves ex Fern.-Vill. in Blanco, Fl. Filip., ed. 3, Nov. App. 160. 1880. Vitex glaberrima Zipp. ex Span., Linnaea 15: 330. 1841. Vitex timoriensis Walp., Repert. 4: 84. 1844. Vitex leucoxydon Span. ex Miq., Fl. Ind. Bat. 2: 863. 1856 [not V. leucoxydon L. f., 1781, nor Roxb., 1814, nor Wall., 1847, nor Schau., 1893]. Vitex cofassus var. timorensis H. Hallier, Meded. Rijks Herb. Leid. 37: 47. 1913. Vitex cofassus var. pubescens



H. Hallier, Meded. Rijks Herb. Leid. 37: 48. 1918. Vitex cofassii var. timorensis H. Hallier ex H. J. Lam, Verbenac. Malay. Arch. 195, sphalm. 1919. Vitex glandulosa H. J. Lam, Verbenac. Malay. Arch. 199. 1919. Vitex litoralis Decne. ex Stapf, Ind. Lond. 6: 479. 1931. Vitex littoralis Desen., in herb. Vitex parviflora Decne., in herb. Vitex parviflorum Juss., in herb. Vitex litoralis L., in herb.

Literature: A. L. Juss., Ann. Mus. Hist. Nat. Paris 7: 76. 1806; Decne., Nouv. Ann. Mus. Paris 3: 401. 1834; Blanco, Fl. Filip., ed. 1, 514--516. 1837; Spanoghe, Linnaea 15: 330. 1841; Walp., Repert. 4: 84. 1844; Miq., Fl. Ind. Bat. 2: 863--865. 1856; Teijsm., Natuurk. Tijdschr. Ned. Ind. 34: 508--509. 1874; Blanco, Fl. Filip. 2: pl. 227. 1878; Fern.-Vill. in Blanco, Fl. Filip., ed. 3, Nov. App. 160. 1880; Vidal, Sin. Fam. & Gen. Pl. Lef. Filip. [Introd. Fl. For. Filip.] Atlas pl. 75, fig. C. 1883; Ahern, Philipp. Woods 69. 1901; Heyne, Nutt. Plant. Nederl. Ind. 4: 113. 1917; E. D. Merr., Sp. Blanc. [Dept. Agr. Bur. Sci. Publ. 12]: 333. 1918; H. Hallier, Meded. Rijks Herb. Leid. 37: 47--48. 1918; H. J. Lam, Verbenac. Malay. Arch. 169, 199, 213--214, & 370. 1919; H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5 (2): 175. 1922; E. D. Merr., Enum. Philipp. Pl. 3: 395. 1923; Heyne, Nutt. Plant. Nederl. Ind. 1317. 1925; Stapf, Ind. Lond. 6: 479. 1931; Yenke & al., Philip. Journ. Sci. 55 (1): pl. 7, fig. 2. 1934; Blumea 2: 262. 1937; Moldenke, Alph. List Common Names 2, 3, 6, 7, 11, 14, 15, 17, 18, 20--22, 26, 27, & 29--31. 1939; Moldenke, Geogr. Distrib. Avicenn. 40. 1939; Moldenke, Suppl. List Common Names 7 & 10. 1940; Moldenke, Prelim. Alph. List Invalid Names 49--52. 1940; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 27, 63, 64, 66--68, 75, & 104. 1942; Moldenke, Alph. List Invalid Names 52--55. 1942; Moldenke, Phytologia 2: 121. 1944; Menninger, Evergr. Trees Street Pl. [7--8]. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 49, 142, 144, 147--150, 166, & 202. 1949; Menninger, Winter 1950 Seed List n.p. 1950; Roig y Mesa, Dicc. Bot. 2: 825 & 1115. 1953; Menninger, Cat. Flow. Trop. Trees 16. 1953.

Illustrations: Blanco, Fl. Filip. pl. 227 (colored). 1878--1880; Vidal, Sin. Fam. & Gen. Pl. Lef. Filip. [Introd. Fl. For. Filip.] Atlas pl. 75, fig. C. 1883; Ahern, Philipp. Woods 69. 1901; Yenke & al., Philip. Journ. Sci. 55 (1): pl. 7, fig. 2. 1934.

Small, medium, or large-sized, often gnarled tree, to 17 m. tall; trunk to 90 cm. in diameter, crooked, branched from below the middle; wood moderately or very hard and durable, heavy, brittle, dull-yellow or yellowish, burly, without taste or odor; main branches erect, rising from below the middle, ultimately wide-spreading and abundantly brachiate toward the ends; bark gray or light-gray or somewhat yellowish, shredding into fine linear plates or finely checked longitudinally; branchlets medium-slender, rather crooked, short, erect or suberect, mostly ampliate and thickened at the nodes, obtusely tetragonal, gray,

lenticellate, glabrous; twigs slender, ascending, buff or brownish, yellowish-green when fresh, usually conspicuously white-lenticellate, minutely puberulent with very short canescent or brownish hairs, becoming glabrate in age; nodes annulate; principal internodes 1--4 cm. long; leaves decussate-opposite, 3-foliolate, spreading horizontally or drooping; petioles slender or stoutish, 3--7.5 cm. long, conspicuously flattened above, convex beneath, canaliculate, very sparsely and minutely pulverulent-puberulent, becoming glabrous, slightly ampliate at the base; leaflets subequal or the 2 lateral ones slightly smaller, all rather long-petiolulate on slender conspicuously canaliculate and submargined minutely pulverulent or glabrate petiolules 3--19 mm. long; leaflet-blades chartaceous, rather uniformly grayish-green on both surfaces or darker green above and lighter beneath, slightly conduplicate on the upper surface when fresh, the central one oblong-elliptic or elliptic, 4--14.5 cm. long, 2.2--5 cm. wide, acuminate or caudate at the apex, varying to acute or even obtuse on smaller leaflets, entire, wavy-margined when fresh, abruptly acute or short-acuminate at the base, minutely and obscurely pulverulent on both surfaces or glabrous and subnitid, the lateral ones similar in all respects but often less caudate at the apex; midrib yellowish when fresh, slender, flat above, prominent beneath; secondaries slender, 4--13 per side, arcuate-ascending, prominent on both surfaces, rather indistinctly joined in many loops at the margins beneath; vein and veinlet reticulation abundant, very fine, prominent on both surfaces; inflorescence axillary and terminal, paniculate-thyrsoid, erect or ascending, 10--21 cm. long, pinkish-gray, 4.5--13.5 cm. wide, often composed of 1--5 pairs of opposite paniculate branches, sometimes simple, each panicle composed of 4--10 or more pairs of stipitate rather few-flowered or submany-flowered cymes; peduncles (2--4 cm. long) and rachis slender, similar to the twigs in texture, color, and puberulence or sometimes densely canescent-puberulent; inflorescence-branches slender, similar to the rachis in all respects, often densely canescent-puberulent; pedicels grayish or mostly obsolete; bracts often present in the larger thyrsoid inflorescences, foliaceous, 2- or 3-foliolate, long-stipitate, similar to the leaflets in all respects but much smaller; bractlets and prophylla linear, 1--3 mm. long or less, caducous; flowers odorless; corolla blue or light-blue to purplish or purplish-blue; fruit drupaceous, black, about 8 mm. wide.

This species has been found on steep slopes, rocky headlands, and grassy slopes, and in thickets near the sea, at altitudes of 10 to 300 meters, blooming in every month of the year except December, in fruit in January, March, May, June, July, and from September to December. Whitford has a photograph of three trees of this species with trunk diameters of 44, 58, and 76 cm., growing in dry limestone soil. Hagger says it is found in forests throughout the Philippine Islands, the timber being very hard and durable and one of the most valuable in the Philippines. Menninger says it is a "tall, evergreen, shady timber tree with

clusters of small blue flowers", introduced into the United States by the Fairchild Tropical Garden. Roig says it was introduced into Cuba at Vivero Forestal de la Ciénaga, Havana, and "es un árbol coposo, ornamental, de hojas palmeadas y flores moradas en panículas terminales. Florece de junio a septiembre y sus flores son muy visitadas por las abejas." It is planted in forest preserves on the Hawaiian Islands. Yuncker's no. 3007 is from Punaluu Valley, Koolau Range, and does not state on its label that it is from cultivated material; Acuña 18318 also does not bear indication on its label that it was from cultivated material. On Sibuyan Elmer says it grows in shrubby-filled dry gulches in the cogon grass region and in woods skirting the upper limit of the cogon grass at altitudes of 1000 to 1500 feet.

Herbarium material has been mis-identified as V. cofassus Reinw., V. leucoxyllum L. f., V. littoralis A. Cunn., V. loureiri Hook. & Arn., V. punctata Schau., V. quinata (Lour.) F. N. Will., and V. trifolia L. Teijsmann says "een attreksel van den bast op Timor wordt gedronken tegen geelen watersucht." Common names recorded for it are "adgaún", "alah", "allah", "amaráun", "amuaían", "amugaían", "amulaían", "anla", "bulaíen", "burikán", "edieu", "foeli kaá", "hamolaíen", "hamoráon", "hamulai", "hamulaíon", "hamuráon", "hamuyáon", "huláh", "kajoe koela", "kajoe koelah", "kalipápa", "kalipápa-bató", "kauere", "kulimpápa", "kulipápa", "malabalinanau", "maraúin", "maülaúin-aso", "molauin", "molaúin", "molave", "moláve", "moláve-batú", "moláve de playa", "muláon", "mulauin", "mulaúin", "muraúin", "roble de Filipinas", "sagad", "sagat", "salingkápa", "sasalit", "taga", "topas", "tugas", "tugas-abgauen", "tugas-buffogon", and "tugas-lanhan".

Merrill states that "There is no doubt in my mind, after studying our very full series of Philippine Vitex, and Blanco's descriptions, that the three species described by Blanco are all referable to the common Vitex parviflora Juss. (V. littoralis Decne.). In both Vitex altissima and V. geniculata I interpret Blanco's description to include 3-foliolate and 5-foliolate leaves, which is probably due to the inclusion of Vitex turczaninowii Merr., for Vitex parviflora invariably has 3-foliolate leaves. Fernandez-Villar's reduction of Vitex latifolia Blanco to V. pubescens Vahl is certainly incorrect, for Blanco's description does not apply to Vahl's species, and moreover Vitex pubescens is not found in Luzon; the type of V. latifolia Blanco was from San Mateo, not far from Manila. Vitex parviflora Juss. is very common and widely distributed in the Philippines and yields the very hard timber commercially known as "molave" or "molauin".

Stevens 1671 is infested by Meliola ganophylli Stevens, n. sp. (type). Dr. Hansford of Australia, monographer of Meliola, thinks Stevens 1670, 1712, and 1726, all from Luzon and the types respectively of Meliola benguetensis, M. pistaciae, and M. micromeli are also on the same host, but in my opinion they are

on another and non-verbenaceous plant, all the same, but not Vitex parviflora nor any other Vitex species. No. 1726 is said by the collector to be on Micromelum minutum, 1712 on Pistacia sp., and 1670 on Othophora sp., but G. N. Jones says none of them match any species in those genera and look more like a Vitex. No. 1671 was said by Stevens to be on Ganophyllum falcatum.

Citations: PUERTO RICO: L. E. Gregory 48 (N, N); Horne s.n. [road between Mayaquey and Maricao, Aug. 1933] (N). PHILIPPINE ISLANDS: Basilan: W. I. Hutchinson s.n. [Herb. Philipp. Forest Bur. 6125], in part (Br). Guimaras: Gammill s.n. [Herb. Philipp. Forest Bur. 95] (N). Luzon: Adduru 90 (Gg--31503); Aguilar s.n. [Herb. Philipp. Forest Bur. 6016] (Bz--24529); Ahern 370 [376] (Bz--24507); Alambra s.n. [Herb. Philipp. Forest Bur. 28086] (Bz--24505, Bz--24526); R. J. Alvarez s.n. [Herb. Philipp. Forest Bur. 18542] (Br); Barros s.n. [Herb. Philipp. Forest Bur. 18869] (Gg--31505); Bernardo s.n. [Herb. Philipp. Forest Bur. 15139] (Bz--24542); Borden s.n. [Herb. Philipp. Forest Bur. 771] (Bz--24527, N, Po--64773); M. Cenabre s.n. [Herb. Philipp. Forest Bur. 31357] (N, N); M. K. Clemens 18177 (La, La), s.n. [Herb. Philipp. Bur. Sci. 19006] (V); H. M. Curran s.n. [Herb. Philipp. Forest Bur. 4899] (Bz--24521), s.n. [Herb. Philipp. Forest Bur. 5460] (Br), s.n. [Herb. Philipp. Forest Bur. 5782] (Br), s.n. [Herb. Philipp. Forest Bur. 5844] (Bz--24533), s.n. [Herb. Philipp. Forest Bur. 10208] (N), s.n. [Herb. Philipp. Forest Bur. 10654] (Bz--24516); Curran & Merritt s.n. [Herb. Philipp. Forest Bur. 7712] (Bz--24528); Darling s.n. [Herb. Philipp. Forest Bur. 14891] (Bz--24513); G. Edaño s.n. [Herb. Philipp. Bur. Sci. 48764] (Bz--24511); A. D. E. Elmer 17286 (Bz--24540, N, S, Ut--67350), 18089, in part (N, S, Ut--67294, V); Escritor s.n. [Herb. Philipp. Bur. Sci. 21078] (N, Vt); Fénix s.n. [Herb. Philipp. Bur. Sci. 12970] (Cm, Gg--31504); S. García 5 (Mi); Haenke 570 (N), 578 (N), 579 (N), 582 (N), s.n. [1792] (Gg--267595, I, Ms); Hagger 255 (N); Kienholz 421 [Herb. Philipp. Bur. Sci. 15443] (Ur); Klemme s.n. [Herb. Philipp. Forest Bur. 5243] (N), s.n. [Herb. Philipp. Forest Bur. 5247] (Bz--24535); Loher 4427 (N); Madarang s.n. [F. C. Gates 7036] (Ka--66590); E. D. Merrill 2084 (N), 2196 (N); M. L. Merritt s.n. [Herb. Philipp. Forest Bur. 18016] (Bz--24512); Oro 207 [Herb. Philipp. Forest Bur. 30832] (N); Paduada s.n. [Herb. Philipp. Forest Bur. 29810] (V); Parros & Nera s.n. [Herb. Philipp. Forest Bur. 3-143] (V); M. Ramos 1867 (Bz--24538); Reves s.n. [Herb. Philipp. Forest Bur. 7476] (Bz--24522); Simeon s.n. [Herb. Philipp. Forest Bur. 28754] (Bz--24531); F. L. Stevens 1671 (It); Whitford 906 (N), 1243 (N). Masbate: W. W. Clark s.n. [Herb. Philipp. Forest Bur. 2526] (N, Po--64779), s.n. [Herb. Philipp. Forest Bur. 2540] (N); E. D. Merrill 3072 (N), 3079 (N). Mindanao: Ablaza s.n. [Herb. Philipp. Forest Bur. 30281] (V); Ahern 659Q [6590] (Bz--24508), 1504Q (Bz--24530); A. D. E.

Elmer 10995 (Ut--27428), 11031 (Bz--24519, N), 13140 (Bz--24506, N, Ut--33528), 14218, in part (Du--174286); Klemme s.n. [Herb. Philipp. Forest Bur. 15212] (Cm); D. P. Miranda s.n. [Herb. Philipp. Forest Bur. 20545] (Cm), s.n. [Herb. Philipp. Forest Bur. 20573] (Cm); Nee 32 (Q), 33 (Q); Quadras 344 (N); Ramos & Edaño s.n. [Herb. Philipp. Bur. Sci. 49518] (S); Reillo s.n. [Herb. Philipp. Bur. Sci. 16463] (Bz--24541); Wenzel 2759 (Au, Br, Bz--24504); Whitford & Hutchinson s.n. [Herb. Philipp. Forest Bur. 9213], in part (Ut--16456). Mindoro: Bermejos s.n. [Herb. Philipp. Bur. Sci. 1522] (Bz--24534, N); E. D. Merrill 2443 (N); M. L. Merritt s.n. [Herb. Philipp. Forest Bur. 3561] (Bz--24523); Rosenbluth s.n. [Herb. Philipp. Forest Bur. 11326] (Er, Bz--24525), s.n. [Herb. Philipp. Forest Bur. 12219] (Bz--24515). Negros: H. E. Curran s.n. [Herb. Philipp. Forest Bur. 17452] (Ez--24543); H. D. Everett s.n. [Herb. Philipp. Forest Bur. 5548] (Bz--24532). Sibuyan: A. D. E. Elmer 10995 (Bz--24520, N, Vt). Ticao: Rosenbluth s.n. [Herb. Philipp. Forest Bur. 12531] (Er). Island undetermined: Cuming 686 [Herb. Reich-  
enbach f. 86696] (V). JAVA: Houter 12 (Bz--24249), 171 (Bz--24486). BRITISH NORTH BORNEO: M. K. Clemens 10274 (Bz--25445). SALAJAR ISLANDS: Salajar: Star 4 [Boschproefst. BB.22943] (Bz--24544); Teijsmann 13813 (Bz--24545, Bz--24546). LESSER SUNDA ISLANDS: Rot: Rahm 7 [Boschproefst. BB.6935] (Bz--24499, Bz--24500). Semaoc: Voogd 2324 (Bz--24491). Timor: Collector undesignated 450a (Ut--53107); Heyne I (Bz--24492, Bz--24493, Bz--24495); Teijsmann 5165 (Bz--24487, Bz--24488), 5165 B.H. (Vt--11607), 8935 (Ez--24501, Bz--24502, Bz--24503), 8936 (Bz--24489, Bz--24490), 8941 (Bz--24496, Bz--24497), 8944 (Bz--24498). MOLUCCA ISLANDS: Amboina: Dolleschal 118 (V). HAWAIIAN ISLANDS: Oahu: Yuncker 3007 (Dp); Degener & Park 9510 (N), 11243 (N). CULTIVATED: Cuba: Acuña 16513 (Es), 18318 (Es); Alain 3053 (Hk, Z); J. G. Jack 3374 (N, N). Florida: Fennell 495 [U. S. Plant Introd. 101265] (Oa--9232); Menninger s.n. [Stuart, August 8, 1946] (N); H. N. Moldenke 21455 (Z). Hawaiian Islands: Degener & Parks 9509 (I); Posberg 12965 (N); A. F. Judd s.n. [Dec. 1, 1930] (Bz--24251, N); F. Kerr s.n. [Degener 19361] (N). Hongkong: Ford 25 (K). Maryland: Fennell 1040 [U. S. Plant Introd. 101265] (Oa--9231). Philippine Islands: Garcia y Baza s.n. [Manila J. Bot.] (V, V); Llobrera s.n. [Herb. Philipp. Bur. Sci. 76575] (Ba). LOCALITY OF COLLECTION UNDETERMINED: C. Curtis s.n. [Langkani] (V). MOUNTED ILLUSTRATIONS: Whitford p. 583, pl. 16, part 1 (Z).

VITEX PARVIFLORA var. PUBERULENTA Moldenke, Phytologia 3: 439. 1951.

This variety differs from the typical form of the species in having the leaflet-blades decidedly puberulent on the midrib and secondaries beneath and the inflorescence densely flavescent-

pubescent throughout.

The type of the variety was collected by L. Mangubat [Herb. Philipp. Bur. Sci. 1361] at Mendez Nufiez in the province of Cavité, Luzon, Philippine Islands, in August, 1906, and is deposited in the Herbarium Bogoriense at Euitenzorg. It is known thus far only from the original collection.

Citations: PHILIPPINE ISLANDS: Luzon: Mangubat s.n. [Herb. Philipp. Bur. Sci. 1361] (Bz--24536--type, N--isotype, N--photo of type, Z--photo of type).

VITEX PARVIFLORA f. STERILIS H. J. Lam ex Moldenke, Phytologia 4: 78, nom. nud. 1952.

Literature: H. J. Lam, Verbenac. Malay. Arch. 214. 1919; H. J. Lam in Lam & Bakh., Bull. Jard. Bot. Euitenz., sér. 3, 3: 57-58. 1921; Moldenke, Phytologia 4: 78. 1952.

Haec forma a forma typica speciei recedit floribus plusminusve a bracteis bracteolisque tomentosis et alabastris rudimentalibus substitutis, pedunculis inflorescentiorum ramulisque densiore flavescenti-pubescentibus vel subtomentosis, et fructibus galliformibus.

This teratological form differs from the normal form of the species in having some or all of its flowers replaced by great masses of tomentose bracts and bracteoles, among which are minute rudimentary buds containing sublunate Closterium-like objects which show under the microscope light tips and dark centers separated by plane concave toward the tips. These are doubtless the eggs of a Cecidomya insect, by the stings of which the flowers were prevented from developing. The drupes which develop are enlarged to about 9 mm., their upper walls considerably enlarged and containing a rather large number of holes, rounded above, in which live the larvae, one in each hole; the cells below them do not contain ovules. The peduncles, rachis, inflorescence-branches, and pedicels are more densely flavescents-pubescent or subtomentose.

Elmer describes it as a rather small and low tree or even shrub-like, growing in black compact soil of secondary forests at 750 feet altitude on Gamaguin Island, Mindanao, with a stem 6 or more inches in diameter, 15--25 feet tall, branched from below the middle, with spreading branches, forming a rather dense rounded crown, the leaves horizontal or drooping, slightly folded, or the margins coarsely wavy, coriaceous or subcoriaceous in texture, the flowers odorless and greenish-yellow, and the irregularly subglobose fruits green and less than half an inch long (in November). He records the common name "tugas".

Ordinarily plants that are galled through insect infestation are not worthy of special nomenclatorial designation, but in this case the changes resulting in the inflorescence are so amazing, so uniform, and so very commonly found without the obvious galling associated with such conditions, that specimens have been widely collected and distributed to herbaria all over the world. In some cases such specimens are the only specimens available of the species in a given herbarium and workers there

may receive the erroneous impression that this is the normal and typical aspect of the species, relegating normal specimens, if sent in for determination, elsewhere. The condition is similar to that seen in many horticultural forms based on teratological conditions and propagated for their bizarre characteristics. The form is accurately described by Lam in the two references cited above and annotated by him with the form designation on many labels of specimens and copied as such by other herbarium workers.

Lam & Bakhuizen cited as "partly sterile" Ahern 3750 and Fénix 3 from Luzon and Elmer 14218 from Mindanao, and as "completely sterile" Ahern 389Q from Mindanao, McGregor 1218 from Bohol, Achacaso 25361 from Panay, and, from Luzon, Ahern 326Q and 7520, Ahern's Collector 2158, Borden 2022, Alzares 22120, Tamesis 11903, and Merrill Sp. Blanc. 340. Of the additional collections cited below the Herb. Philipp. Forest Bur. 1445, 6125, 7481, and 24731, Merrill 5454, Ahern 37, Haenke 566, and Sulit 63 are partly sterile, while Herb. Philipp. Forest Bur. 1218, 2158, 5815, 9213, 12398, and 28569, Ahern 389 and 752Q, Williams 2330, Ramos 16, and Kanehira 2734 are completely sterile. Merrill Sp. Blanc. 340 is partially sterile on some sheets and completely so on others. Williams states that his material came from a tree 70 feet tall, with a trunk 2 feet in diameter, with blue flowers in June; wood sections are preserved on the sheets. The Sulit 63 collection has a label stating that it is "cultivated and naturalized" on Luzon.

The type of the form was collected by Richard Crittenden McGregor [Herb. Philipp. Bur. Sci. 1218] on Bohol, Philippine Islands, in May, 1906, and is deposited in the Herbarium Bogoriense at Puitenzorg.

Citations: PHILIPPINE ISLANDS: Basilan: W. I. Hutchinson s.n. [Herb. Philipp. Forest Bur. 6125], in part (Bz--24513). Bohol: R. C. McGregor s.n. [Herb. Philipp. Bur. Sci. 1218] (Bz--24554--type, N--isotype, N--photo of type, Z--photo of type). Luzon: Ahern 37 (N), 752Q [7520] (Bz--24556), 326Q [3260] (Bz--24543, Bz--24549), 3750 (Bz--24557); Ahern's Collector s.n. [Herb. Philipp. Forest Bur. 1445] (N), s.n. [Herb. Philipp. Forest Bur. 2153] (Bz--24551, N, Po--64775); R. J. Alvarez s.n. [Herb. Philipp. Forest Bur. 22120] (Bz--24552); Borden s.n. [Herb. Philipp. Forest Bur. 2022] (Bz--24550, N); H. M. Curran s.n. [Herb. Philipp. Forest Bur. 5815] (N); Eder s.n. [Herb. Philipp. Forest Bur. 28569] (Bz--24517); A. D. E. Elmer 13089, in part (Bz--24539); Fénix 3 (Br, Bz--24559); Haenke 566 (N); Leuterio s.n. [Herb. Philipp. Forest Bur. 24731] (N); Loatoc s.n. [F. C. Gates 3410] (Mi); E. D. Merrill Sp. Blanc. 340 (Bz--24555, N, V); Merritt & Curran s.n. [Herb. Philipp. Forest Bur. 12398] (Bz--24514); M. Ramos 16 (Ut--22104); Reyes s.n. [Herb. Philipp. Forest Bur. 7431] (N); Sulit 63 (N). Mindanao: Ahern 389 (N), 389Q [3890] (Bz--24547); A. D. E. Elmer 14218, in part (Bz--

24558, N, Ut--33521, V); Kanehira 2734 (N); E. D. Merrill 5454 (Br, N); D. P. Miranda s.n. [Herb. Philipp. Forest Bur. 17942] (Ka--64781, Mi, Ur); Pray s.n. [Herb. Philipp. Forest Bur. 15464] (N); Whitford & Hutchinson s.n. [Herb. Philipp. Forest Bur. 9213], in part (Fz--24524); R. S. Williams 2880 (N, N). Panay: Achacoso s.n. [Herb. Philipp. Forest Bur. 25361] (Bz--24537).

VITEX PATULA E. A. Bruce in Bruce & al., *Bothalia* 6: 237--238. 1951.

Literature: E. A. Bruce in Bruce & al., *Bothalia* 6: 237--238. 1951; *Biol. Abstr.* 26: 1746. 1952.

A summer-flowering shrub or small tree, 2.4--5 m. tall; branches rather straggling, spreading, subterete, gray or pale-brown, sparsely pubescent, later glabrescent, longitudinally fissured; young branchlets tomentose with pale yellow-brown hairs; leaves decussate-opposite, mostly 3-foliolate, rarely 4- or 5-foliolate; petioles 3.5--6.5 cm. long, subequaling the inflorescences, terete, not canaliculate, pubescent or when young short-tomentose; leaflet-blades submembranous, not coriaceous, sessile or subsessile, the central one obovate, 4--7.5 cm. long, 2--3.5 cm. wide, rounded or rarely subacute at the apex, entire, cuneate at the base, sparsely glandulose beneath and crisp-pubescent along the secondaries, sparsely scabridous above, more densely pubescent when young, the lateral ones smaller, obovate-elliptic, 3--6.5 cm. long, 2--3.5 cm. wide; secondaries 8--11 per side, more or less spreading, prominent beneath; tertiaries distinct, parallel to each other; cymes axillary, dichotomous, borne near the apex of the branches; peduncles 3--4 cm. long, densely pubescent or subtomentose; bractlets linear, 8--13 mm. long, pubescent or tomentose; flowers small, pedicellate; calyx obscurely bilabiate, tomentose on the outside, glabrescent within, its tube campanulate, about 2.5 mm. long, 5-lobed, the 3 anterior lobes longer than the 2 posterior ones, triangular, 1--1.5 mm. long; corolla mauve, its tube narrowly infundibular, longer than the calyx, about 4.5 mm. long, about 1.5 mm. wide at the base and 3.5 mm. wide at the apex, the lobes unequal, rounded at the apex, tomentose, the anterior one largest, transversely elliptic, 3--5 mm. long, about 4 mm. wide, the lateral ones ovate, about 2.5 mm. long and 2 mm. wide; stamens 4, inserted at the base of the corolla-tube, short-exserted; ovary globose, about 1 mm. long and wide, glabrous, with a few glands toward the apex; fruit black, ovoid, about 1.5 cm. long and 9 mm. wide.

The type of this species was collected by L. E. Codd (no. 5319) in low velt bush on a rocky hillside, at an altitude of 1500 feet, on Dzundweni Hill, 11 1/2 miles southeast of Punda Maria, in Kruger National Park, Zoutpansberg district, Transvaal, Union of South Africa.

Miss Bruce also cites for this species E. A. Bruce 172 from Kruger National Park, I. B. Pole-Evans 1951 and R. J. Rodin 4232



from Wylies Poort, Transvaal, L. E. Codd 4163 from Zoutpansberg, Transvaal, W. Lamont 45 from Louis Trichard, Transvaal, Gomes e Sousa 3885 from Mozambique, W. Lamont 27 from Portuguese East Africa, and J. Hutchinson 2101 from Limpopo, as well as L. E. Codd 4227 from Transvaal which I regard as V. amboniensis Gürke. Dr. Meeuse feels that he can separate V. patula from V. amboniensis by habit and by leaf-apex characters.

VITEX PAYOS (Lour.) Merr., Trans. Am. Phil. Soc., new ser., 24 (2): 334. 1935.

Synonymy: Allazia payos Lour. apud Silva Manso, Enum. Subst. Braz. 36. 1836. Jaracatia brasiliana Pison ex Silva Manso, Enum. Subst. Braz. 36, in syn. 1836. Vitex hildebrandtii Vatke, Linnaea 43: 534. 1882. Vitex shirensis Baker in Thiseit.-Dyer, Fl. Trop. Afr. 5: 326, in part. 1900. Vitex eylesii S. Moore, Journ. Bot. 45: 154. 1907. Vitex guerkeana Engl. ex Eyles, Trans. Royal Soc. South Afr. 5: 459. 1916 [not V. guerkeana Hiern, 1900, nor DeWild., 1909, nor Pearson, 1928]. Vitex hildebrandtii Vatke, in herb.

Literature: Silva Manso, Enum. Subst. Braz. 36. 1836; Vatke, Linnaea 43: 534. 1882; Gürke in Engl., Pflanzenw. Ost-Afr. C: 339. 1895; J. G. Baker in Thiseit.-Dyer, Fl. Trop. Afr. 5: 326. 1900; S. Moore, Journ. Bot. 45: 154. 1907; S. Moore, Journ. Linn. Soc. Lond. Bot. 40: 168. 1911; Eyles, Trans. Royal Soc. South Afr. 5: 459. 1916; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 49, 65--66, & 82. 1928; E. D. Merr., Trans. Am. Phil. Soc., new ser., 24 (2): 334. 1935; Hill, Ind. Kew. Suppl. 9: 297. 1938; Moldenke, Prelim. Alph. List Invalid Names 50. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50, 51, 75, & 104. 1942; Moldenke, Alph. List Invalid Names 53 & 55. 1942; Moldenke, Alph. List Invalid Names Suppl. 1: 2. 1947; Moldenke, Plant Life 2: 58 & 64. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 117, 120, 121, 166, & 202. 1949; Pardy, Rhod. Ag. Journ. 50: 186. 1953; Hauman, A. E. T. F. A. T. Index n.p. 1954; Wild, South. Rhodes. Bot. Dict. 137. 1954.

Large shrub or tree, to 8 m. tall; trunk to 22 cm. in diameter at breast height; branchlets short, densely pilose; leaves 5-foliolate; petioles stoutish, about 10.2 cm. long, tetragonal-flattened, very densely villous-tomentose with rather long cinereous hair, not noticeably ampliate at the base, somewhat disciform and more densely villous at the apex; leaflets unequal in size, the 2 lowermost ones usually greatly reduced, all very shortly petiolulate or the two lowermost subsessile; petiolules stoutish, 1--2 mm. long, flattened, margined, very densely villous with cinereous hairs; leaflet-blades chartaceous, bright- or dark-green above, albidous beneath, the central one obovate or oblong, 5--11.5 cm. long, about 5 cm. wide, rounded or obtuse at the apex, entire, narrowed or long-acuminate at the base, rather sparsely strigillose-pubescent above, rather densely pubescent-tomentose with matted and irregular whitish hairs beneath, the 2 lateral ones similar in all respects, the 2 lowermost ones

usually much reduced, more oblong-elliptic or only oblanceolate, acute at the base; midrib slender, flat but usually more densely cinereous-pubescent above, prominent and densely tomentose beneath; secondaries slender, to about 10 per side, irregular, somewhat arcuate-ascending, obscure or indiscernible above, prominent and more densely tomentose beneath; vein and veinlet reticulation rather sparse, indiscernible above, the larger portions more densely pubescent beneath; inflorescence axillary, cymose, about 13.5 cm. long and 8.5 cm. wide, about 5 times dichotomous, the first dichotomy wide-spreading and long-branched, the rest rather dense, many-flowered, densely cinereous-pubescent or incanous-tomentose or subvillous throughout; peduncles slender, about 9 cm. long, flattened, slightly ampliate at the apex and more densely villous there; cymes bearing a conspicuous central flower in each dichotomy, whose pedicel and calyx are usually more densely long-villous than those of the lateral flowers; pedicels slender, 1--3 mm. long, densely cinereous- or incanous-villosulous; bractlets linear, elongate, to 12 mm. long, densely incanous-villosulous or villous; prophylla minute, linear, hidden in the tomentum; calyx campanulate; about 2 mm. long, densely pubescent, its rim toothed, the teeth ovate; corolla heliotrope, varying to dirty-white or white with a purple lip, its tube a little longer than the calyx, very hairy, the lobes oblong; stamens not exerted; fruit green when immature, purple-black or black when ripe.

Silva Manso, in the reference cited above, states that this plant, like Carica papaya L., is cultivated in Brazil and abounds in oil that can be used as a laxative, especially for domestic animals. It has been collected in anthesis in June, October, and November, and in fruit in October. It grows in tree veld grasslands and among granite rocks, to an altitude of 4500 feet. Common names for it are "chikubai", "jacaratiá", "m chaukela", "m tsubvu", "mucoro", "muhubva", "mu kubvu", "mukubvu", "mu towa", "mutsubvu", "n towa", "umbalebale", "umbindoio", "um bindois", "umchangwela", and "umtschwankela".

Crook says that various birds, including lowries, Natal purple-crested bulbuls, and black-collared basbets, eat the fruit of this species. Dr. W. L. Thompson, of the American Board of Missions, who sent 32 seeds of this plant from Mount Silinda, Southern Rhodesia to the Federal Horticultural Board of the United States Plant Introduction Garden, and which were received there on June 30, 1924, says that the fruit is eaten with relish by the Rhodesian natives. "We also enjoy it occasionally", he adds. Munch and Wild also report the fruit as edible, and Pimenta says it is eaten in Portuguese East Africa. Yet Eyles makes the statement that the fruit is "not eaten". The Boivin collection cited below has a label reading "Zanzibar" but this is an error, as the collection was made on Mombasa Island.

Bakes cites for V. hildebrandtii the following collections and describes the leaflets as sessile: Hildebrandt 1249 from Dar-es-Salaam, Volkens 1 from Usambara and Holst 2101 from

Tanga, Tanganyika Territory, and Buchanan 113 from Nyasaland. V. eylesii, based on Eyles 1201 from Bulawajo, Southern Rhodesia, was named in honor of Mr. Frederick Eyles (1864--1937), who collected some 8000 specimens in Southern Rhodesia from 1904 to within a short time of his death, according to H. Wild in a letter to me dated February 9, 1949, and not for George Eyles as erroneously stated by me in "Plant Life". Wild states that he long felt that V. eylesii and V. hildebrandtii were conspecific, but could not be sure. Pieper says "Der schmalere Tubus der Korolle bietet kein Unterscheidungsmerkmal, um V. Eylesii von V. Hildebrandtii zu trennen, da die Breite des Tubus innerhalb der Blütenstände desselben Exemplars wechselt. Auf die Unmöglichkeit der Unterscheidung von Hildebrandtii und Eylesii weisen auch schon die verschiedentlich gemachten Bemerkungen auf den Herbarbogen hin." Of the specimens cited as V. shirensis by Baker only the Whyte s.n. [Zomba] belongs here; Buchanan 231 is V. mombassae Vatke. Eyles believes that V. eylesii might be conspecific with what he called V. cienkowski Kotsch. & Peyr. (= V. doniana Sweet), a species actually very distinct from it.

Citations: BELGIAN CONGO: Brédo 3503 (Br, N), 3825 (Br, Br); Cabu 48 (Br), 107 (Br); Quarré 4311 (Br, Br), MOMBASA ISLAND: Boivan s.n. [Mombaza, 1947-1952] (N, N, P, P, P, P). ANGOLA: Lynes 636c (Br). NORTHERN RHODESIA: E. Milne-Redhead 516 (Br). SOUTHERN RHODESIA: Crook L.118 [Govt. Herb. Salisbury 31040] (N); H. M. Forbes 277 (Na--35666); Harvie 17/49 (Rh--26726); Munch 29a (Rh--16882); Whellan 473 [Govt. Herb. Salisbury 31206] (N); Wild 1253 [Govt. Herb. Salisbury 15404] (N). BRITISH NYASALAND PROTECTORATE: J. Buchanan s.n. [J. L. Wood 6970] (N, N--photo, Na--14371, Z--photo). PORTUGUESE EAST AFRICA: Quilimane: Pimenta s.n. [Govt. Herb. Salisbury 17230] (N). CULTIVATED: Florida: Fennell s.n. [U. S. Pl. Introd. 60427; Fed. Hortic. Board 52302] (Ar--19757, Ba, E--photo, E--1115781--photo, N, N--photo, W--photo, Z--photo).

VITEX PAYOS var. GLABRESCENS (Pieper) Moldenke, Known Geogr.

Distrib. Verbenac., [ed. 1], 79. 1942.

Synonymy: Vitex hildebrandtii var. glabrescens Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 66. 1928.

Literature: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 66 & 82. 1928; Moldenke, Alph. List Invalid Names 53. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50, 51, 79, & 104 (1942) and [ed. 2], 117, 120, 121, & 202. 1949.

This variety differs from the typical form of the species in being less densely tomentose on the youngest parts and glabrescent in age.

Pieper admits that a hard and fast boundary between the variety and the typical form of the species is difficult to draw. He based the variety on Braun 3519, Prittwitz 8, and Stuhlmann 373 from Tanganyika Territory, Buchanan 6970 from Nyasaland, and Allen 151, Engler 3120, Johnson 17 and 96, and Swynnerton 34,

1059, 1060, and 1061 from Portuguese East Africa. Herbarium material has been identified as "V. hildebrandii Vathe". A common name recorded for the plant is "tsubou".

Citations: BELGIAN CONGO: Brédo 4223, in part (Br), 4794 (Br, Er, N). SOUTHERN RHODESIA: Herb. Queen Victoria Memorial 6987 (Rh); V. Vincent 68 [Govt. Herb. Salisbury 39583] (N). BECHUANALAND PROTECTORATE: O. B. Miller E.3 (N, Rh).

VITEX PAYOS var. ZAMBESIACA (J. G. Baker) Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 79. 1942.

Synonymy: Vitex zambesiaca J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 322. 1900. Vitex hildebrandtii var. zambesiaca (Baker) Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 66 & 82. 1928.

Literature: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 322. 1900; Sim, For. Fl. Res. Port. East Afr. 94. 1909; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 66, 82, & 85. 1928; Moldenke, Alph. List Invalid Names 53 & 65. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50, 51, 79, & 104 (1942) and [ed. 2], 121 & 202. 1949.

This variety differs from the typical form of the species in its thinner and only sparsely pubescent peduncles, only about 1 mm. in diameter.

It is a large tree; branchlets stout, angular, densely whitish-pubescent with short hairs; leaves 3--5-foliolate; petioles 7.5--10 cm. long; leaflet-blades thin-textured, green and obscurely pubescent on the upper surface, densely matted-tomentose with whitish hairs beneath when young, more thinly so when mature, sessile, obovate-cuneate, 10--12.5 cm. long, 5--6.3 cm. wide, obtuse at the apex, entire; cymes axillary, many-flowered, long-pedunculate, dense, the branches densely pubescent; calyx campanulate, about 2 mm. long, densely pubescent, its rim toothed, the teeth ovate, acute at the apex; corolla twice as long as the calyx; fruit drupaceous, about the size of a plum, edible.

The type of this variety was collected by Sir John Kirk near the base of Morambala Mountain, Lower Shire, Mozambique, Portuguese East Africa. It was originally described as having only 3-foliolate leaves, but Pieper points out that "Die Angabe, dass die Blätter dreizählig seien, trifft nicht zu. Die Blättchennarben lassen erkennen, dass die Mehrzahl der Blätter fünfzählig ist."

Citations: PORTUGUESE EAST AFRICA: Esselen s.n. [Vila Pery, Aug. '24] (Af, N--photo, Z--photo).

VITEX PEARSONII Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 75. 1928.

Synonymy: Vitex gürkeana H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 217--218. 1901. Vitex guerkeana Pearson apud Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 75, in syn. 1928 [not V. guerkeana Miern, 1900, nor DeWild., 1909, nor Engl., 1916].

Literature: H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 217--218. 1901; Pieper in Engl., Bot. Jahrb. 62, Beibl. 111 ["112"]: 53, 75, 82, & 84. 1928; Moldenke, Alph. List Invalid Names 53. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 75. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 121 & 202. 1949.

A small bush; internodes short; leaf-scars prominent; branches densely tawny-pubescent when young; leaves decussate-opposite, 5-foliolate; petioles 5--6.3 cm. long, tawny-pubescent; petiolules 4--12 mm. long, tawny-pubescent; leaflet-blades membranous, ovate, 5--7.5 cm. long, 2--3.3 cm. wide, acuminate or caudate-acuminate at the apex, entire, the acumen obtuse or minutely apiculate, rounded or subcuneate at the base, sparsely puberulent above, tawny-pubescent beneath, profusely glandulose; secondaries 9--12 per side, obscure, slightly prominent beneath; cymes pedunculate, axillary, divaricate, about half as long as the subtending petioles, the branches and bracts tawny-pubescent; flowers short-pedicellate, bracteolate; calyx campanulate, tawny pubescent and glandulose outside, glabrous within, the tube 2--3 mm. long, the limb broadly spreading, 5-lobed, the lobes deltoid, 0.5--1 mm. long, subacute or rounded at the apex; corolla lavender, its tube curvate, about 6 mm. long, glabrous below, puberulent and glandulose on the upper half outside, pubescent within above the insertion of the stamens, the lobes ultimately reflexed, minutely pubescent and villous, profusely glandulose outside, with many multicellular hairs at the base of the anterior lobe within; stamens inserted above the middle of the corolla-tube, long-exserted; filaments densely villous at the base; ovary conic, densely villous and glandulose on the upper half; fruit not known.

The type of this species was collected by Rose Monteiro [Mrs. Joachim John Monteiro, née Bassett] (no. 20) at Delagoa Bay, Lourenço Marques, Portuguese East Africa. It is known only from the original collection. Pieper says that from the description it appears to be a member of Subgenus Holmskioldiopsis.

VITEX PEDUNCULARIS Wall., Numer. List [48], no. 1753, hyponym (1829); Schau. in A. DC., Prodr. 11: 687. 1847.

Synonymy: Vitex morava Buch.-Ham. ex Wall., Numer. List [48], no. 1752, hyponym. 1829. Vitex pentaphylla Lamb. ex Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940 [not V. pentaphylla Merr., 1909, nor Pavon, 1940, nor Sessé & Moc., 1940]. Vitex alata Wall. ex Moldenke, Alph. List Invalid Names Suppl. 1: 23, in syn. 1947 [not V. alata Willd., 1803, nor Heyne, 1821, nor Roxb., 1829, nor Schau., 1885, nor Royen, 1940]. Vitex procumbens Hort., in herb.

Literature: Rheede, Hort. Ind. Malab. 5: 1--2, pl. 1. 1635; Roth, Nov. Sp. 316. 1821; Wall., Numer. List [48], nos. 1752 & 1753. 1829; Schau. in A. DC., Prodr. 11: 687. 1847; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 584 & 587. 1885; Hook. f. & Jacks., Ind. Kew. 2: 1213. 1895; Basu, Ind. Medic. Pl. 3: 3, pl.

741. 1918; Ind. Forester 47: pl. 9 & 10. 1921; Moldenke, Geogr. Distrib. Avicenn. 40. 1939; Moldenke, Alph. List Common Names 30. 1939; Moldenke, Suppl. List Common Names 12. 1940; Moldenke, Prelim. Alph. List Invalid Names 49, 51, & 52. 1940; Biswas, Indian Forest Rec. Bot., new ser., 3: 42. 1941; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 55, 59, 60, 75, & 104. 1942; Moldenke, Alph. List Invalid Names 52 & 54. 1942; Moldenke, Alph. List Invalid Names Suppl. 1: 28. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 125, 128, 129, 137, 138, 166, & 202. 1949.

Illustrations: Basu, Ind. Medic. Pl. 3: pl. 741. 1918; Ind. Forester 47: pl. 9 & 10. 1921.

Shrub or tree, to 32 m. tall; trunk grayish-brown, to 50 cm. in circumference; bark whitish, dark-brown when cut, the living bark to 4 cm. thick, the dead bark to 1.5 cm. thick; branchlets very slender, grayish, obtusely tetragonal or subterete, medullose, densely puberulent or short-pubescent at the very apex, otherwise glabrous, not noticeably lenticellate; twigs very slender, dark-brown or purplish in drying, minutely and very sparsely strigillose-puberulent or pulverulent, becoming glabrate and shiny in age; nodes annulate, those on the twigs marked with a band of denser puberulence; principal internodes 1.3—9 cm. long; leaf-scars small or rather large, somewhat prominent; leaves decussate-opposite, 3-foliolate, fully expanded during anthesis; petioles very slender, 3.5—7 cm. long, convex beneath, conspicuously flattened and more or less margined (especially at the apex) above, very sparsely and minutely strigillose-puberulent or glabrous in age, slightly ampliate at the base, not disciform at the apex; leaflets subequal, all subsessile or petiolulate on slender, deeply canaliculate and margined petiolules 1—10 mm. long; leaflet-blades subchartaceous, rather uniformly bright-green on both surfaces, the very immature ones brunnescent in drying, the central one oblong, narrow-elliptic, or lanceolate, 7—16 cm. long, 1.8—4.9 cm. wide, acuminate at the apex, entire, acuminate at the base and attenuate into the petiolule, minutely and sparsely pulverulent on both surfaces when young and margined with a band of canescent puberulence, becoming glabrate above in age and very sparsely pulverulent or glabrate beneath, rather densely covered with tiny resinous scale-like punctae beneath even in age, the lateral ones similar in all respects; midrib very slender, flat above, prominent beneath; secondaries very slender, 10—25 per side, numerous and close together, arcuate-ascending, subprominent on both surfaces, not distinctly joined at the margins; vein and veinlet reticulation rather abundant, very fine, slightly subprominent on both surfaces (especially above) or obscure beneath; inflorescence axillary, paniculate, solitary or paired in the upper axils, 8—26 cm. long, 3—6 cm. wide, long-pedunculate, composed of 7—11 pairs of opposite or subopposite, long-stipitate, 1—3 times dichotomous, loosely few-flowered cymes; peduncles very slender, 3—9.5 cm. long, mostly slightly flattened, minutely pulverulent-puberulent; cyme-branches elongate, rather densely

canescent-puberulent, flattened; foliaceous bracts none; bractlets and prophylla linear, 1--3 mm. long, puberulent; flowers with a slight sweetish odor or not odorous; corolla white, light pink, or yellow.

Kostermans describes the fruit as "green, up to 9 cm. and 5 cm. in diam.", but it seems most probable that this is an error for "mm.", illustrating again one of the most unfortunate aspects of the metric system where the error of a single letter may cause considerable confusion. Common names for the species are "kyetyo" (also applied to V. peduncularis var. roxburghiana), "popoul thmar", and "tin nök" (also applied to V. pinnata L.). It has been collected in clay soil of open forests and scattered in deciduous forests, ascending to 360 meters altitude, blooming in March and April, fruiting in June. Herbarium material has been misidentified as V. alata Roxb., V. heterophylla Roxb., V. heterophylla var. genuina Lam, V. pierriana Dop, V. quinata (Lour.) F. N. Willd., and V. sumatrana var. urceolata (C. B. Clarke) King & Gamble. The "Mail-elau" of Rheede, sometimes cited as this species, is V. altissima L. f. Basu's illustration, cited above, shows alate petioles and may actually not belong here either.

The Helfer specimen in the Britton Herbarium has its inflorescences abnormally modified, probably by a fungus.

Citations: INDIA: Sikkim: T. Anderson 938 (Bz--25165). West Bengal: C. B. Clarke 11733j (Bz--24562); Helfer s.n. (N, S); Mukerjee 1502 (S); Rao 5680 (N). BURMA: Upper Burma: Herb. Burma Forest School 14 (N), 38 (N), 47 (Br); Meebold 14948 (S); Prazer 7 (Bz--25127); Ton s.n. [Herb. Burma Forest School 11] (Br); Zan 46 (S). MERGUI ARCHIPELAGO: Tavoy: Mokim 539 (Bz--24560). INDO-CHINA: Annam: Poilane 1336 (Bz--72850); Squires 777 (Bz--24566, Er, N, S), 861 (Bz--24565, N, S). Cambodia: Béjaud 523 (N); Poilane 14937 (Bz--72851, Bz--72852). Cochinchina: Poilane 17320 (Bz--72854); Thorel 1006 (Bz--72853). THAILAND: Bunnak 76 [Herb. Roy. Forest Dept. 9779] (Z); Herb. Roy. Forest Dept. 87 (N); Kostermans 813 (Bz--73304). CULTIVATED: India: Gaudichaud s.n. [hort. Calcutt., 1847] (Du--166535); Herb. Hort. Bot. Calcuttensis s.n. [March, 1888] (Cp), s.n. (Br, Br, Bz--24561, Ed, K, Le, Mu, Nu, N, T, V); Voigt s.n. [H. B. Serampore] (Cp, N--photo, Z--photo); Wallich s.n. [H. B. Calcutt.] (Cp, Cp, N--photo, N--photo, S--photo, Z--photo, Z--photo). LOCALITY OF COLLECTION UNDETERMINED: Herb. Pierre s.n. (S); Roxburgh s.n. (Br).

VITEX PEDUNCULARIS var. ROXBURGHIANA C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 537. 1885.

Synonymy: Vitex alata Roxb. ex Willd. in Rottl., Gesell. Naturforsch. Freunde Berlin, Neue Schriften, 4: 203. 1803 [not V. alata Willd., 1803, nor Heyne, 1821, nor Schau., 1885, nor Royen, 1940, nor Wall., 1947].

Literature: Rheede, Hort. Ind. Malab. 5: pl. 1. 1635; Willd.

in Rottl., Gesell. Naturforsch. Freunde Berlin, Neue Schr. 4: 203. 1803; Roth, Nov. Pl. Sp. 316. 1821; Wall., Numer. List [48], no. 1752. 1829; Roxb., Fl. Ind. 3: 72. 1832; Schau. in A. DC., Prodr. 11: 685. 1847; Dalz. & Gibs., Bombay Fl. 201. 1861; Kurz, For. Fl. Brit. Burma 2: 272. 1877; Gamble, Man. Ind. Timb. 298. 1981; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 587. 1885; Lisboa, Useful Pl. Bombay 201. 1886; Jacks., Ind. Kew. 2: 1213. 1895; Moldenke, Suppl. List Common Names 3, 4, 8, 9, 12, 14--16, & 20. 1940; Moldenke, Prelim. Alph. List Invalid Names 49. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 55 & 104. 1942; Moldenke, Alph. List Invalid Names 52. 1942; Moldenke, Phytologia 2: 121. 1944; H. N. & A. L. Moldenke, Pl. Life 2: 79. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 125, 128, 129, & 202. 1949.

This variety is said to differ from the typical form of the species in being less gray-pubescent, in having the petioles winged, and the panicle more laxly few-flowered.

It is based on a specimen collected by Edgeworth at Parasnath, Bihar, and one by Hooker & Thomson from the Khasia Terai, India, another by Hooker & Thomson from East Bengal, Pakistan, and one by Kurz from Pegu, Upper Burma. Clarke states that this is the "V. alata Roxb. Fl. Ind. 3: 72; Wall. Cat. 1752; Kurz, For. Fl. 2: 272, not Heyne nor Schau." He says, further, that Roxburgh quotes for his Chittagong V. alata Rheede Hort. Mal. 5: pl. 1 "which has leaves that might do, but a totally different inflorescence and is Heyne's V. alata."

The variety is said also to be mentioned in Roxb., Fl. Ind., ed. C. B. C., 482, in A. Campbell, Rept. Ec. Pl. Chutia Nagpur, no. 9231, in Aplin, Rep. on the Shan States, and in Gazeteer Mysore & Coorg 1: 43 & 64, but I have not been able to check these references.

The wood is purplish to reddish-gray, heavy, hard, close-grained, and weighing 60 pounds per cubic foot. Common names recorded are "bhadu", "boruna", "goda", "hila auwal", "krawru", "kyetyo", "marak", "navaládi", "osai", and "shelangri". According to Watt this tree occurs in East Bengal, Pakistan, in Upper Burma, and in Bihar, Bombay, Gota Nagpur, and the Khasi States, India.

Campbell reports that in Chota Nagpur the bark is used for making an external medical application in treating pains in the chest. Watt says that the timber is used in Cachar for posts and beams, in the Garo hills for sugarcane crushers, and in Chota Nagpur for yokes. Santapau, in a letter to me dated February 16, 1948, asserts that the "Maharatta country", "Warri jungles", and "Konkan" of Watt are all in Bombay Presidency. The common name "goda" is also applied to Vitex glabrata R. Br.

VITEX PENTADACTYLA Velenovsky, K. Böhm. Gesell. Wiss. Sitzungsab. 1881: 213. 1882.

Literature: Velenovsky, K. Böhm. Gesell. Wiss. Sitzungsab. 1881: 213. 1882; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 42.



1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 166 & 202. 1949.

This is the earliest known fossil in the Verbenaceae, coming from the Cretaceous of Bohemia, in rocks about 5,500,000 years old.

VITEX PENTAMERA Engelhardt, Abh. Hess. Geol. Landesanstalt Darmstadt 7 (4): 69, pl. 23, fig. 15. 1922.

Literature: Engelhardt, Abh. Hess. Geol. Landesanstalt Darmstadt 7 (4): 69, pl. 23, fig. 15. 1922; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 42. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 166 & 202. 1949.

Illustrations: Engelhardt, Abh. Hess. Geol. Landesanstalt Darmstadt 7 (4): pl. 23, fig. 15. 1922.

The original description and discussion of this plant are worth repeating here: "Das Blatt ist fingerförmig, Fünffzählig (?), die Blättchen sind länglich, ganzrandig, am Grunde gerundet, vorn spitz, kurz gestielt; der Mittelnerv derselben ist stark und gerade; die Seitennerven entspringen unter spitzen Winkeln, sind fein und bogenläufig.

"Wir haben ein zusammengesetztes Blatt vor uns, von dessen stärkerem Stiele dünnere ausgehen, an welche sich je zwei kurzgestielte Blättchen anschließen. Das unvollständig erhaltene seitwärts liegende dürfte wohl abgebrochen sein und an dem verdickten Ende des Blattstieles gestanden haben. Ist dies der Fall, so hatten wir ein fünfzähliges Blatt vor uns, das grosse Ähnlichkeit mit solchen einiger Vitex-Arten z.B. V. montevidensis Cham. & Schl. besaß, weshalb ich es vorläufig, bis uns bessere Stücke völlige Klarheit verschaffen, in diese Gattung einreihe.

"Ausdrücklich sei noch auf die grosse Ähnlichkeit mit den Blättern von Dewalquea gelindenensis Sap. et Mar. (Gelinden Taf. 9) hingewiesen, die wohl in der Stellung der Blättchen mit unserer Blatte übereinstimmen, nicht aber in deren Form, da sie sich nach dem Grunde keilförmig verschalern, vorn aber spitz und ausgerandet sind."

VITEX PERRIERI Danguy, Bull. Hist. Nat. Paris 30: 508--509. 1924.

Literature: Danguy, Bull. Hist. Nat. Paris 30: 508--509. 1924; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 75, 78, & 84. 1928; Hill, Ind. Kew. Suppl. 7: 252. 1929; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 75. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 123 & 202. 1949.

Shrub or small tree; branchlets medium-stout, obtusely tetragonal, densely appressed-tomentose (not villous as stated by Danguy) when young, glabrescent in age, gray; twigs more slender, plainly tetragonal or flattened, very densely appressed-tomentose or tomentellous with pale flavescent hairs; nodes not annulate; principal internodes 1.5--4.5 cm. long; buds densely flavescent-villous; leaf-scars rather large, not very prominent;

leaves decussate-opposite, 5-foliolate; petioles stoutish, 3.5--8 cm. long, very densely flavescent-tomentose; petiolules conspicuous, the central one 1--3 cm. long, densely flavescent- or brownish-tomentellous, the lateral ones 1--12 mm. long; leaflet-blades chartaceous, rather uniformly bright-green on both surfaces, elliptic (not oblong as stated by Danguy), 3--12 cm. long, 2--8 cm. wide, acute or obtuse (rarely rounded) at the apex, entire, rounded or subtruncate at the base, rarely acute, rather densely pubescent on both surfaces, subvillosulous on the larger veins beneath; midrib slender, flat and usually densely villous above, prominent beneath; secondaries slender, 8--12 per side, ascending, flat above, prominulous beneath, anastomosing in many small loops at the very margins beneath; veinlet reticulation abundant, slightly subimpressed above, prominulous beneath; inflorescence axillary, the cymes few-flowered, dichotomous, bracteate, shorter than the subtending petioles; peduncles comparatively stout, 1.5--2 cm. long, very densely flavescent-tomentose; bractlets linear, 5--10 mm. long, with the inflorescence-branches very densely flavescent-tomentose; flowers sessile; calyx campanulate, thick-textured, 9--12 mm. long, 5--8 mm. wide, 10-costate with very prominent ribs, densely canescent villous or flavescent-tomentose on the outside, long-pilose within; corolla reddish, tubular, the tube slightly incurved, 1.5--1.8 cm. long, very densely appressed-villous or lanuginous with whitish antrorse hairs on the outside, villous at the base within, glabrous at the apex within, the limb 5-lobed, the lobes slightly unequal, about 3 mm. long, the posterior ones larger and broader, the anterior one longer and tongue-shaped; stamens 4 (or 3?), exserted, glabrous, about 1.8 cm. long; filaments green, inserted at the lower part of the corolla-tube, villous at the base; anthers small, 2-celled, introrse; pistil glabrous; ovary globose, with 4 ovules; style filiform, 2--2.2 cm. long, bifid at the apex; fruiting-calyx enlarged, campanulate, about 15 mm. long and wide, very densely flavescent-tomentellous, venose but not costate, rather deeply and irregularly lobed; fruit ovoid, shiny, 1.5--1.5 cm. long, glabrous, 4-celled, enclosed by the mature calyx.

The type of this species was collected by Joseph Marie Henri Alfred Perrier de la Bâthie (no. 373) at Tsarasaotra, Madagascar, in November, 1897, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. It is known from sandy plateaus, 80--120 meters altitude, blooming in November, and fruiting in February.

Citations: MADAGASCAR: Perrier de la Bâthie 373 (N--isotype, N--photo of type, P--type, P--isotype, Z--photo of type); Service Forestiere 7 (P), 99 (N, P).

VITEX PERVILLEI J. G. Baker, Fl. Maurit. & Seych. 256. 1877.

Literature: J. G. Baker, Fl. Maurit. & Seych. 256. 1877; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 75, 78, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 75. 1948; Mol-

denke, Known Geogr. Distrib. Verbenac., [ed. 2], 123 & 202.1949.

Shrub, 1--4 m. tall; stems much branched, glabrous; branches and branchlets slender, gray, glabrous, twiggy, irregular, not lenticellate; nodes not annulate; principal internodes 0.5--4.5 cm. long, often very much abbreviated on twigs; leaf-scars somewhat prominent on twigs, less so on older wood; leaves decussate opposite, 3-foliolate; petioles very slender, 1.7--3 cm. long, glabrous; petiolules filiform, mostly very short, the lateral ones mostly 1--2 mm. long, the central one sometimes to 15 mm. long, glabrous; leaflet-blades very thin-membranous and fragile when immature (during anthesis), firmly chartaceous or "subcoriaceous" (according to Baker) when mature (during fructescence), elliptic or lanceolate (not "oblong" as stated by Baker), 2.5--9 cm. long, 1.2--3.7 cm. wide, gradually narrowed from the middle or below the middle to a rather obtuse apex, acute or acuminate, entire (or sometimes coarsely dentate-lobed on sprouts), acute or acuminate (not "cuneate-spatulate" as stated by Baker) at the base, uniformly green and glabrous on both surfaces, somewhat brunnescent in drying when immature; midrib slender, sharply prominulous above and prominent beneath; secondaries very slender, 5--10 per side, conspicuously prominulous on both surfaces on mature leaves, arcuate-ascending, joined in broad loops 1--2 mm. from the margins; veinlet reticulation abundant, conspicuously prominulous above on mature leaves, slightly less so beneath; inflorescence axillary and terminal, short-pedunculate, rather few-flowered, simple or paniculate, shorter than the subtending leaves, brunnescent in drying; peduncles slender, 1--1.7 cm. long, glabrous, flattened; bractlets linear, 1--3 mm. long, glabrous; pedicels filiform, 1--2 mm. long, glabrous or very minutely and microscopically pilosulous, incrassate at the apex in age; calyx campanulate, about 2 mm. long and wide, glabrous or microscopically pilosulous toward the apex, brunnescent in drying, its rim 5-dentate, the teeth very short, triangular-ovate, acute, 0.5 mm. long or less; corolla white, its tube cylindrical, about 3 mm. long, straight, glabrous, its limb 4--5 mm. wide; stamens and style short-exserted; fruiting-pedicels to 1 cm. long, glabrous; fruiting-calyx incrassate, shallowly cupuliform or broadly campanulate, to 5 mm. long and 8 mm. wide, its rim very shallowly and obscurely dentate, glabrous; fruit drupaceous, obovate-elliptic, 1--1.3 cm. long, 5--10 mm. wide, glabrous.

The species is based on two collections of Auguste Pervillé, no. 636 from the Seychelles, and no. 870 bis from the northeastern part of Madagascar, collected in 1841. A vernacular name is "hofaty". It has been collected in anthesis in April, November, and December, in sandy places on a plateau at 100--150 meters altitude. A label says "0.25 diam.", but it is not clear if this means "m." or "cm." and if it applies to the stem or not.

Citations: SEYCHELLES ISLANDS: Pervillé 636 (K--cotype, N--cotype, N--photo of cotype, P--cotype, Z--photo of cotype). MADAGASCAR: Boivin s.n. [Madagascar, 1847--1852] (P); Perrier de la Bâthie 1170 (P), 1181 (N, P), 17307 (P); Pervillé 870 bis (K--

cotype, N--photo of cotype, Z--photo of cotype); Richard s.n. [Ambongo, comm. 1846] (P); Service Forestier 29 (N, P), 53 (P).

VITEX PERVILLEI var. PUBESCENS Moldenke, Phytologia 3: 444--445. 1951.

This variety differs from the typical form of the species in having its young twigs, petioles, petiolules, both surfaces of the leaflet-blades, peduncles, cyme-branches, pedicels, bractlets, and calyxes densely puberulent, and the lower leaflet-surface densely resinous-punctate.

The type of the variety was collected by my good friend and colleague, Dr. Henri Humbert (no. 3019) among siliceous rocks on rocky slopes, altitude 800--1000 meters, in the valley of Ihoay, basin of the Mangoky, Madagascar, on October 29 or 30, 1924, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. The same collector's no. 2999 is accompanied by a long description in French of the flowers, ovary, etc., and by line drawings.

Citations: MADAGASCAR: Humbert 2999 (P), 3019 (N--isotype, N-photo of type, P--type, P--isotype, Z--photo of type).

VITEX PETERSIANA Klotzsch in Peters, Naturwiss. Reise Mossamb. Bot. 264. 1862.

Synonymy: Vitex kirkii J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 321. 1900.

Literature: Klotzsch in Peters, Naturwiss. Reise Mossamb. Bot. 264. 1862; Gürke in Engl., Pflanzenw. Ost-Afr. C: 340. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 315 & 320--321. 1900; Sim, For. Fl. & Res. Port. East Afr. 94. 1909; Eyles, Trans. Royal Soc. South Afr. 5: 459. 1916; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 44, 57--58, 83, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51 & 104. 1942; Moldenke, Alph. List Invalid Names 53. 1942; H. N. & A. L. Moldenke, Plant Life 2: 66 & 76. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 119, 121, & 202. 1949; Wild, Vict. Falls Handb. 131 & 158. 1953; Wild, South. Rhodes. Bot. Dict. 138. 1954.

Spreading bush or shrub, 2 m. tall, or small tree; branchlets finely gray-pubescent; leaves 3-foliolate; petioles short, less than 2.5 cm. long; leaflet-blades moderately firm in texture, oblong or ovate, obtuse or acute at the apex, entire or incised-serrate, bright-green and glabrous above, paler and pubescent beneath, the central one 2.5--4 cm. long; cymes axillary, often 2 or 3 at the apex of the branchlets, very lax-flowered, with a solitary flower in the axil of each furcation; peduncles short, pubescent; pedicels short, pubescent; bractlets linear, small or minute, villous; calyx campanulate or cyathiform, about 2 mm. long, pubescent, its rim 5-dentate, the teeth minute, deltoid; corolla blue in bud, pink when open, about 1.2 cm. long, pubescent, the tube twice as long as the calyx, the lower lip much longer than the upper lip; fruit drupaceous, globose, about the size of a large pea (Pisum sativum).

The type of this species was collected by Wilhelm Carl Hartwig

Peters at Tette, on the lower Zambesi River in Mozambique, Portuguese East Africa. V. kirkii is based on an unnumbered collection from the same place by Sir John Kirk in 1861 and on Menyharth 372 from Boruma in northern Zambesia, Rhodesia. To these Pieper adds an unnumbered Allen collection from Victoria Falls, and Wild adds Allen 60 and Rogers 5377 and 5323 from the same place. A common name for the species is "umfulikolio". It has been collected in anthesis in November and December.

Baker distinguishes V. kirkii from V. petersiana by stating that in the former the leaflet-blades are oblong, while in the latter they are ovate. Pieper states that this character does not hold. He adds "Lediglich die Tatsache, dass die jüngeren Triebe bei Kirkii reicher entwickelt sind, kann ebenfalls zur Unterscheidung der beiden Arten nicht massgebend sein."

Citations: NORTHERN RHODESIA: A. A. Pardy s.n. (N, Rh--4755); Wild 3195 (N, Rh--26368).

VITEX PETERSIANA var. TETTENSIS (Klotzsch) Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 58. 1928.

Synonymy: Vitex tettensis Klotzsch in Peters, Naturwiss. Reise Mossamb. Bot. 264. 1862.

Literature: Klotzsch in Peters, Naturwiss. Reise Mossamb. Bot. 264. 1862; Gürke in Engl., Pflanzenw. Ost-Afr. C: 340. 1895; J. G. Baker in Thiselet.-Dyer, Fl. Trop. Afr. 5: 315 & 320. 1900; Sim, For. Fl. & Res. Port. East Afr. 94. 1909; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 58 & 84. 1928; Moldenke, Alph. List Invalid Names 55. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104 (1942) and [ed. 2], 121 & 202. 1949.

This variety differs from the typical form of the species in having its pubescence much more sparse on all its parts, especially on the calyx. The pubescence is also said to be pale-brown instead of gray, the leaflet-blades are short-cuspidate at the apex, 2--2.5 cm. long, glabrous above, pubescent on the secondary veins beneath, the cymes few-flowered, calyx cyathiform, 4- or 5-toothed, and the corolla-tube cylindric, sparsely pubescent on the outside.

The variety is based on an unnumbered collection made by Peters at Tette, on the lower Zambesi River in Mozambique, Portuguese East Africa. It is known only from the original collection.

VITEX PHAETRICHA Mildbr. ex Pieper in Fedde, Repert. 26: 163. 1929.

Synonymy: Vitex phaestricha Mildbr. ex Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 45, 58, & 84, hyponym. 1928.

Literature: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 45, 58, & 84. 1923; Pieper in Fedde, Repert. 26: 163. 1929; Hill, Ind. Kew. Suppl. 3: 249. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104 (1942) and [ed. 2], 114 & 202. 1949.

Tall tree; young branches fuscous-villous; leaves 5-foliolate; petioles 5--9 cm. long; leaflets sessile, the blades obovate,

obtuse and very shortly apiculate at the apex, cuneate at the base, many-nerved, hirsute above, villous beneath, densely fuscous-pilose with appressed hairs on the venation on both surfaces, especially beneath; inflorescence axillary, elongate, conspicuously branched, fuscous-villous; peduncles equaling the subtending petioles; bractlets filiform, about 5 mm. long; flowers small, to 5 mm. long; calyx campanulate, about 2 mm. long, fuscous-hirsute outside, the rim distinctly and regularly 5-dentate; corolla slightly curvate, the tube covered with sessile glands on the outer surface, the lobes fuscous-hirsute outside; filaments glandular-pilose, barbate at the base; ovary globose, glandulose at the apex; fruiting-calyx and fruit not known.

The type of this species was collected by Günther Tessmann (no. 876) on the campo along the way to Alen, Cameroons, and is deposited in the herbarium of the Botanisches Museum at Berlin. An additional collection cited by Pieper is Zenker 4191, collected in the primeval forest at Bipinde, Cameroons.

VITEX PHASEOLIFOLIA Mildbr., *Wiss. Ergebn. Zent. Afr. Exped.* 1910/1911 2: 80, hyponym. 1922; Pieper in Fedde, *Repert.* 26: 161. 1929.

Synonymy: Vitex agelaeifolia Mildbr., *Wiss. Ergebn. Zent. Afr. Exped.* 1910/1911 2: 30, hyponym. 1922 [not V. agelaeifolia Mildbr., 1923].

Literature: Mildbr., *Wiss. Ergebn. Zent. Afr. Exped.* 1910/1911 2: 30 & 80. 1922; Pieper in Engl., *Bot. Jahrb.* 62, Beibl. 141 ["142"]: 42, 55, & 84. 1928; DeWild., *Pl. Bequaert.* 5: 20. 1929; Pieper in Fedde, *Repert.* 26: 161. 1929; Hill, *Ind. Kew. Suppl.* 8: 249. 1933; Moldenke, *Alph. List Invalid Names* 51. 1942; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 48, 102, & 104 (1942) and [ed. 2], 114, 200, & 202. 1949.

Shrub; bractlets tetragonal, glabrous; leaves 3-foliolate; petioles 4--8 cm. long, glabrous or subglabrous; leaflet-blades glabrous or subglabrous, entire or subentire, the central one obovate-elliptic, acuminate at the apex, the lateral ones obliquely elliptic, 6--10 cm. long, 3--6 cm. wide, acuminate at the apex, subcordate at the base; central petiolule about 4 mm. long, the lateral ones very short; secondaries 3 or 4 per side; inflorescence axillary, paniculate, the lateral branches congested, spiciform, short-pubescent; pedicels 1--2 mm. long; bracts subulate, caducous; uppermost bractlets minute, navicular, obtuse; calyx cyathiform, about 3 mm. long, sparsely glandulose and puberulent on the outside, its rim truncate, regularly denticulate and ciliate; corolla conspicuously geniculate, somewhat more than twice the length of the calyx, glandulose on the outside, the upper lip plainly 2-lobed; style inserted below the apex of the ovary, arcuate; ovary globose or conic, truncate, glabrous; fruiting-calyx patelliform; fruit small, drupaceous, about 1 cm. in diameter.

The type of this species was collected by Gottfried Wilhelm Johannes Mildbraed (no. 7623) in cleared land in front of Ebo-lowa Station, southern Cameroons. The type of V. agelaeifolia

(1922, not 1928) is Mildbraéd 5452 from large Dscha-Bogen, Kongulu, Lomie, southern Cameroons. Both types are deposited in the herbarium of the Botanisches Museum at Berlin. Pieper refers to both binomials as "nom. sol.", but inasmuch as definite specimens are cited in each case, they are actually hyponyms, not nomina nuda.

Pieper describes the fruit as baccate, but in this genus it is actually uniformly drupaceous.

VITEX PHILLYREAEFOLIA J. G. Baker, Journ. Linn. Soc. Lond. Bot. 20: 226--227. 1883.

Literature: J. G. Baker, Journ. Linn. Soc. Lond. Bot. 20: 226--227. 1883; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 76, 79, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104 (1942) and [ed. 2], 123 & 202. 1949.

A much-branched erect shrub; branches and branchlets slender, gray, very obtusely tetragonal, very twiggy, glabrous; twigs very slender, short, straight, ascending, obtusely tetragonal, densely appressed-villous with brown antrorse hairs toward the apex, deciduous in age; nodes not annulate; principal internodes 0.5--4.5 cm. long; leaves decussate-opposite, numerous, 1-foliate; petioles slender, 2--10 mm. long, jointed at the apex, flattened and canaliculate above, densely brown-villous with antrorsely appressed hairs when young, glabrescent in age; blades firmly chartaceous, dark-green above, lighter beneath, shiny on both surfaces, glabrous but not smooth-appearing on both surfaces, elliptic, 2--5 cm. long, 1--2.5 cm. wide, usually very obtuse or even emarginate at the apex, acute or deltoid at the base, entire, sometimes slightly emarginate at the apex in drying; midrib slender, impressed above, prominulous beneath; secondaries and veinlet reticulation indiscernible on both surfaces; flowers solitary, nearly sessile in the axils of the upper leaves; bractlets broad, ovate, about twice as long as wide; calyx about 6 mm. long, shaggy-villous with brown silky hairs, the teeth not more than 1/4 as long as the tube, mostly 0.5--1 mm. long; corolla reddish, curvate, about 2.5 cm. long, densely long-pilose or villous with fulvous hairs, the tube about 2 mm. wide at the base and 5 mm. wide at the apex, the limb with its lobes about 2 mm. long, densely antrorsely villous like the tube; stamens and style included in the corolla-tube; ovary densely hairy.

The type of this endemic species was collected by Richard Baron (no. 1446) between Tankay and the east coast, Madagascar, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. It is known only from the original collection.

Citations: MADAGASCAR: Baron 1446 (K--type, N--isotype, N--photo of type, P--isotype, Z--photo of type).

VITEX PIERREANA Dop, Bull. Soc. Hist. Nat. Toulouse 57: 205. 1928.

Literature: Dop, Bull. Soc. Hist. Nat. Toulouse 57: 205. 1928; Hill, Ind. Kew. Suppl. 9: 297. 1933; Merr. & Metcalf, Ling-

nan Sci. Journ. 16: 399. 1937; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 58, 59, & 104. 1942; H. N. & A. L. Moldenke, *Plant Life* 2: 76. 1948; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 135, 137, & 202. 1949.

An erect shrub or tree, to 18 m. tall; trunk 9--30 cm. in diameter; branches gray or grayish-black; bark grayish-yellow, brownish-gray, or gray, rimose; branchlets slightly pubescent or subglabrous; leaves 3-foliolate; petioles 4--5 cm. long, canalliculate, glabrescent; leaflet-blades chartaceous, ovate or ovate-elliptic, acute or acuminate at the apex, entire, obtuse or acute at the base, glabrous and glandulose on both surfaces but pubescent on the venation, the central one 9--10 cm. long, 3--4 cm. wide, the lateral ones smaller; secondaries 14--20, slender, recurved; tertiaries subparallel, regular; veinlet reticulation conspicuous; petiolules of central leaflet 1--2 cm. long, of lateral leaflets about 1 cm. long; inflorescence paniculate, terminal, lax, pyramidal, broad, foliose at the base, pubescent, the cymules di- or trichotomous, corymbiform, divaricate; peduncles 1--2 cm. long; bracts and bractlets none or else minute and caducous; pedicels capillary, 5--3 mm. long; flowers about 8 mm. long; calyx conic, about 2.6 mm. long, pubescent and glandulose on the outside, the rim subtruncate, the teeth 5, very short and acute; corolla whitish-yellow or blue, pubescent and glandular on the outside, its tube about 4 mm. long, villous at the insertion of the stamens within, the upper lip 2-lobed, the lobes about 2 mm. long and glabrous, the lower lip 3-lobed, glabrous inside, the middle lobe about 3 mm. long; stamens scarcely exerted, incurved; filaments villous at the base; anthers black; style equaling the stamens; stigma 2-lobed; ovary glabrous, glandulose at the apex; fruit torus creamy-white; fruit green or pale-green when immature, black when ripe; seeds black.

The species is based on Pierre 273 and 310 from Tay Ninh and Cay Cong, Cochinchina, Indochina. The species is said to be fairly common in dry sandy soil of thickets and dry steep slopes, in woods or mixed woods, forests, in partial shade of forested ravines, along streams, scattered in moist loam along roadsides, and on dry gentle slopes, ascending to 800 feet altitude. It has been collected in anthesis in March and April, and in fruit from June to August. Its wood is used for making pillars, according to Lau. It has been confused in herbaria with V. quinata (Lour.) F. N. Will., but differs in having numerous, straight, parallel, close together secondaries. It is related to V. eberhardtii Dop, but differs in its inflorescence, pubescent calyx, and smaller flowers.

Citations: HAINAN ISLAND: How 70570 (N, S), 70358 (N, S); Lau 16 (N), 1584 (N), 3649 (S), 3385 (S); Liang 62220 (N); C. Wang 32392 (N), 33204 (N), 33757 (N). INDOCHINA: Cochinchina: Pierre s.n. [3/5/1866] (N, S).

VITEZ PIERREI Craib, *Kew Bull.* 1918: 367--368. 1918.

Literature: Craib, *Kew Bull.* 1918: 367--368. 1918; Hill, *Ind.*



Kew. Suppl. 6: 219. 1926; Dop in Lecomte, Fl. Gén. Indo-chine 4: 811 & 848. 1935; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 59, 60, & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 76. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 137, 138, & 202. 1949.

Illustrations: Dop in Lecomte, Fl. Gén. Indo-chine 4: 811 & 848. 1935.

Young branchlets tetragonal or eventually terete, densely soft-pubescent, eventually more or less glabrescent; bark gray-brown; lenticels numerous but not conspicuous; leaves 5-foliate; petioles 3--7 cm. long, densely soft-pubescent; leaflet-blades chartaceous, varying from ovate or oblong to oblanceolate-obovate or obovate, acuminate or caudate at the apex with an acute acumen, entire or irregularly few-serrate along the margins, to 7.5 cm. long and 3.8 cm. wide, cuneate or broadly cuneately attenuate into the petiolule at the base, sparsely pilose above with white bulbous-based hairs, more densely so toward the margins, soft-pubescent beneath especially on the midrib and larger veins and also yellowish-glandulose, the central one largest, the 2 lowest ones small and often caducous; secondaries 8--10 per side, conspicuous above, prominulous beneath; petiolules to 2 cm. long, soft-pubescent; inflorescence similar to that of V. canescens except that the pedicels are shorter and the rachis soft-pubescent and golden-glandulose; bracts small, caducous; pedicels at time of anthesis about 1 mm. long; calyx 3--5 mm. long, appressed-hirsutulous and golden-glandulose, with a few appressed setae within toward the apex, the lobes subequal, deltoid, about 0.75 mm. long, acute or obtuse at the apex, ciliate; corolla in bud short-pubescent and golden-glandulose outside, in anthesis about 7 mm. long, the basal part of the tube cylindrical and about 2 mm. long, the upper lip 2 mm. long, 2-lobed to the middle, the lobes scarcely 1 mm. long and 1.5 mm. wide, rounded at the apex, the lower lip 3-lobed, the middle lobe about 2.75 mm. long, larger than the 2 lateral ones; stamens exerted; filaments papillose at the base; style subequaling the longer filaments; stigma bifid; ovary about 1 mm. long, densely glandulose at the apex.

The species is based on Pierre 1839 from Cochinchina and on Mrs. D. J. Collins 72 from Sriracha, altitude 4.5 meters, Cochinchina.

Citations: INDOCHINA: Cochinchina: Pierre 5218 (F--photo, N, N--photo, S, S, Sg--photo, Z--photo).

VITEX PINNATA L., Sp. Pl., ed. 1, 638. 1753 [not V. pinnata Lour., 1347].

Synonymy: Katou-mail-eloué Rheede, Hort. Ind. Malab. 5: 3--4, pl. 2. 1635. Pistacio-Vitex L., Fl. Zeyl., ed. 1, 195. 1747.

Anonyma Herm. ex L., Fl. Zeyl., ed. 1, 195, in syn. 1747. Vitex latifolia Lam., Encycl. Méth. Bot. 2: 613. 1783 [not V. latifolia Mill., 1768, nor Blanco, 1337, nor Wight, 1340]. Vitex negundo Noronga, Verh. Batav. Gen. 5, ed. 1, art. 4: 86. 1790

[not *V. negundo* L., 1753]. *Vitex pubescens* Vahl, Symb. Bot. 3: 35. 1794; [not *V. pubescens* Heyne, 1829]. *Vitex arborea* Roxb., Hort. Beng. 46, hyponym. 1814; Fl. Ind. 3: 73. 1832. *Wallrothia articulata* Roth, Nov. Pl. Sp. 317. 1821. *Vitex articulata* Steud., Nom. Bot., ed. 2, 2: 777. 1840. *Vitex digitata* Wight ex Steud., Nom. Bot., ed. 2, 2: 777. 1840. *Vitex bracteata* Horsf. ex Miq., Fl. Ind. Bat. 2: 862. 1858. *Vitex heterophylla* Blume ex Miq., Fl. Ind. Bat. 2: 862. 1858 [not *V. heterophylla* Roxb., 1814, nor Williams, 1905, nor Schau., 1919]. *Vitex inaequifolia* Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (3): 223. 1863. *Vitex pubescens* var. *lilacina* Kuntze, Rev. Gen. Pl. 2: 511. 1891. *Vitex pubescens* var. *bicolor* Kuntze, Rev. Gen. Pl. 2: 511. 1891. *Pistacia vitex* L. ex Watt, Dict. Econom. Prod. Ind. 6 (4): 250, in syn. 1893. *Vitex inaequifolia* Turcz. ex Lam & Bakh., Bull. Jard. Bot. Buitenz., sér. 3, 3: 53, in syn. sphalm. 1921. *Vitex pubescens* var. *ptilota* Dop, Bull. Soc. Hist. Nat. Toulouse 59: 198. 1928. *Pistacia vitex* Steud. ex Zohary, Palest. Journ. Bot., Jerus. ser., 5: 227, in syn. 1952. *Vitex latifolia* Vahl, in herb.

Literature: Rheede, Hort. Ind. Malab. 5: 3--4, pl. 2. 1685; L., Fl. Zeyl., ed. 1, 195. 1747; L., Fl. Zeyl., ed. 2, 195. 1748; L., Sp. Pl., ed. 1, 638. 1753; N. L. Burman, Fl. Ind. pl. 43. 1768; West., Univ. Bot. 1: 312. 1770; Lam., Encycl. Méth. Bot. 2: 613. 1788; Noronha, Verh. Batav. Gen. 5, ed. 1, art. 4: 86. 1790; Vahl, Symb. Bot. 3: 35. 1794; Roxb., Hort. Beng. 46. 1814; Roxb., Fl. Ind., ed. 1, 482. 1820; Roth, Nov. Pl. Sp. 317. 1821; Blume, Bijdr. 14: 812. 1826; Wall., Numer. List [48], no. 1747. 1829; Roxb., Fl. Ind., ed. Carey, 3: 73. 1832; Decne., Nouv. Ann. Mus. Nat. Paris 3: 401. 1834; Blanco, Fl. Filip., ed. 1, 514. 1837; Steud., Nom. Bot., ed. 2, 2: 777. 1840; Spanoghe, Linnaea 15: 330. 1841; Zoll. & Moritz, Syst. Verz. 53. 1845--1846; Schau. in A. DC., Prodr. 11: 695 & 696. 1847; Wight, Icon. Pl. Ind. Or. 4: pl. 1465. 1849; Miq., Fl. Ind. Bat. 2: 861--862. 1858; Drury, Useful Pl. India 443. 1858; W. Elliot, Fl. Andhr. 32 & 124. 1859; Mason, Burmah & its People, ed. 2, 526 & 792. 1860; Miq., Fl. Ind. Bat. Suppl. 1: 242. 1860; Hassk., Hort. Malab. Clav. 38. 1862; Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (3): 223. 1863; Kurz, For. Fl. Brit. Burma 2: 271. 1877; Ind. Forester 3: 204. 1877; Blanco, Fl. Filip., ed. 3, 2: pl. 427. 1878; Gamble, Man. Ind. Timb. 297. 1881; Vidal, Sin. Fam. & Gen. Pl. Leff. Filip. [Introd. Fl. For. Filip.] Atlas pl. 75, fig. A. 1883; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 535. 1885; Hemsl., Rep. Scient. Res. Voy. Challenger Bot. 1: 110 & 178. 1885; Kuntze, Rev. Gen. Pl. 2: 511. 1891; Schimper, Bot. Mitteil. Trop. 3: 129. 1891; Watt, Dict. Econom. Prod. Ind. 6 (4): 250. 1893; Jacks., Ind. Kew. 2: 1214. 1895; Koord. & Val., Bijdr. Booms. Java 7: 202. 1900; E. D. Merr., Bur. Gov. Lab. Philipp. Bull. 27: 68. 1905; King & Gamble, Journ. As. Soc. Beng. 74: 848. 1909; Koord., Pl. Jungh. 4: 188. 1910; Tectona 4: 393. 1911; Docters van Leeuwen Bull. Jard. Bot. Buitenz., sér. 2, 3: 49. 1912; Koord., Ex-

kurs. Fl. Java 3: 136. 1912; Elbert, Meded. Rijks Herb. Leiden 12: 16. 1912; Koord. & Val., Atlas Baumart. Java pl. 294 & 295. 1914; Heyne, Nutt. Plant. Nederl. Ind., ed. 1, 4: 114. 1917; H. Hallier, Meded. Rijks Herb. Leiden 37: 44. 1918; H. J. Lam, Verbenac. Malay. Arch. 166, 167, 183--185, & 370. 1919; Lam & Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 53. 1921; Bakh. & Lam, Bull. Jard. Bot. Buitenz., ser. 3, 4 (2): 285. 1922; Docters van Leeuwen, Bull. Jard. Bot. Buitenz., ser. 3, 4: 311 & 314. 1922; H. J. Lam, Bull. Jard. Bot. Buitenz., ser. 3, 5 (2): 178. 1922; E. D. Merr., Enum. Philipp. Pl. 3: 396. 1923; Heyne, Nutt. Plant. Nederl. Ind., ed. 2, 1317--1318. 1927; Foxworthy, Malayan Forest Rec. 3: 163. 1927; Dop, Trav. Lab. For. Toulouse 1 (1): pl. 2. 1928; Dop, Bull. Soc. Hist. Nat. Toulouse 59: 198. 1928; Uittien, Rec. Trav. Bot. Néerl. 25: pl. 8. 1929; Bull. Jard. Bot. Buitenz., ser. 3, 13: 28. 1930; Stapf, Ind. Lond. 6: 479. 1931; Van Steenis, Bull. Jard. Bot. Buitenz., ser. 3, 13: 28. 1933; Crevost & Pételot, Bull. Econom. Indo-Chine 37: 1294. 1934; Moldenke, Alph. List Common Names 1, 2, 18, 21, 22, 27, & 30. 1939; Moldenke, Geogr. Distrib. Avicenn. 21 & 40. 1939; Moldenke, Suppl. List Common Names 2, 4, 6--16, 18, 22, & 23. 1940; Moldenke, Prelim. Alph. List Invalid Names 5, 36, 50--52, & 54. 1940; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Alph. List Invalid Names 4, 36, 52--54, & 57. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 33, 55, 56, 59, 61, 63--66, 75, & 104. 1942; Moldenke, Phytologia 2: 121. 1944; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mexico 20: 15. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 67, 125, 128--130, 137, 139, 140, 142--148, 166, & 202. 1949; Zohary, Palest. Journ. Bot., Jerus. ser., 5: 227. 1952.

Illustrations: Rheede, Hort. Ind. Malab. 5: pl. 2. 1685; N. L. Burman, Fl. Ind. pl. 43. 1768; Wight, Icon. Pl. Ind. Or. 4: pl. 1465. 1849; Blanco, Fl. Filip. pl. 427 (colored). 1878; Vidal, Sin. Fam. & Gen. Pl. Lefl. Filip. [Introd. Fl. For. Filip.] Atlas pl. 75, fig. A. 1883; Koord. & Val., Atlas Baumart. Java pl. 294 & 295. 1914; Foxworthy, Malayan Forest Rec. 3: 163. 1927; Dop, Trav. Lab. For. Toulouse 1 (1): pl. 2. 1928; Uittien, Rec. Trav. Bot. Néerl. 25: pl. 8. 1929.

Small or medium-sized tree, to 25 m. tall; trunk to 70 cm. in diameter at the base and to 45 cm. in diameter at 10--15 m. height, wadded toward the base, more or less crooked; main branches issuing from at or below the middle of the tree, sub-erect or ascending, crookedly rebranched and wide-spreading toward the top; crown to 6 m. wide; branchlets ascending, greenish when fresh, gray on herbarium specimens, slender or stoutish, angular or acutely to obtusely tetragonal, slightly ampliate at the nodes, densely short-puberulent; twigs rather slender or coarse, chestnut- or buff-colored, obtusely or acutely tetragonal, horizontally spreading, with ascending curved tips, often sulcate on the younger parts, densely short-puberulent with brownish or sordid hairs; wood tasteless or bitterish, odorless, smooth, yellowish-white or gray with an olive-brown tinge, the sapwood dingy-white or gray, the central older por-

tions varying from olivaceous or chocolate to brownish or nearly black, very coarse-grained and hard, brittle, heavy, weighing 55 pounds per cubic foot; bark varying from grayish or yellowish-gray to brown, about 1 cm. thick, smooth or minutely checked longitudinally, defoliating in thin pieces, chestnut-colored except for the epidermis, the inner portions yellow; nodes obscurely or not at all annulate, mostly somewhat ampliate and corky; principal internodes 1--7.5 cm. long; leaves horizontally spreading, decussate-opposite, normally 3--5-foliolate (1- or 2-foliolate on seedlings); petioles yellowish-green, slender or stoutish, 4--10.5 cm. long, convex beneath, flattened and submargined above, densely short-puberulent, not noticeably ampliate at the base nor disciform at the apex; leaflets mostly unequal in size, often descending and recurved on the tree, the lower ones often much reduced, all petiolulate on rather slender, puberulent, deeply canaliculate and margined petiolules 1--6 mm. long, or the lowest ones sessile or subsessile; leaflet-blades firmly chartaceous or submembranous, rather thick and firm when mature, rather uniformly dark-green on both surfaces or somewhat lighter beneath, sometimes shallowly incurved or infolded on the tree, the central one elliptic or ovate, 8--22.5 cm. long, 3.5--10.5 cm. wide, acuminate or subcaudate at the apex, entire (the lowest ones often serrate-dentate on seedlings), broadly cuneate or acute at the base, somewhat attenuate, minutely and obscurely pulverulent-puberulent above along the midrib and sometimes also along the secondaries and on the lamina, more densely puberulent or short-pubescent beneath, especially on the larger venation, on petiolules to 6 mm. long, the two lateral ones similar but usually smaller and more acute at the apex, 5.5--15.5 cm. long, 2.5--7 cm. wide, and on petiolules only to 2 mm. long, the 2 lowest (when present) 1.5--5.2 cm. long, 0.7--2.3 cm. wide, and sessile or subsessile; midrib slender, yellowish-green when fresh, flat or subprominent above, prominent beneath; secondaries slender, 8--20 per side, yellowish-green when fresh, flat above, prominent beneath; vein and veinlet reticulation abundant, fine, obscure or subprominent above, prominent beneath, the tertiaries rather straight and parallel; inflorescence terminal, erect, sometimes axillary in the uppermost leaf-axils, thyrsoid-paniculate, 6.5--25 cm. long, 3.5--18 cm. wide, densely many-flowered, brachiate, conspicuously and abundantly bracteolate, densely short-pubescent or puberulent throughout with flavescent or sordid-brownish hairs, the branches often chestnut-colored, tinged with green and purple when fresh; peduncles stout, reddish-brown when fresh, rather acutely tetragonal, often sulcate, 1.8--4 cm. long, densely short-pubescent or puberulent like the young twigs; sympodia and inflorescence-branches tetragonal, sulcate, and pubescent like the peduncles; pedicels obsolete or to 1 mm. long and densely flavescent-pubescent; bracts, bractlets, and prophylla very numerous and conspicuous, foliaceous, simple, pale- or yellowish-green, varying to chestnut and tinged with green and purple, elliptic, 5--17 mm. long, 2--7 mm. wide, densely short-pubescent on both surfaces, sessile, rarely 3-foliolate.